Medical Library

SEP 15

BRITISH MEDICAL JOURNAL

JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

SATURDAY AUGUST 29 1942

TABLE OF CONTENTS

A Classification of Nerve Injuries H. J. SEDDON, D.M., F.R.C.S. 237

Carotinaemia S. ALMOND, M.D., and R. F. L. LOGAN, M.B. 239

Bee-stings in Kenya Colony A. J. JEX-BLAKE, M.D., F.R.C.P. 241

Indirect Radiotherapy W. VIGNAL, M.D. 242

Treatment of Phosphorus Burns A. THELWALL JONES, M.D. 244

Pyogenic Skin Infections and the Skin-carrier Rate N. H. MARTIN, B.M. 245

MEDICAL MEMORANDA

New Diagnostic Sign in Sciatica. A. J. MESTER, M.D. 246

GENERAL ARTICLES AND NEWS

Development of Emergency Blood Transfusion Scheme L. W. PROGER, M.R.C.S. 252

Dehydration of Foods 254

DIPHTHERIA IMMUNIZATION CAMPAIGN 255

APPROVED NAMES OF DRUGS 256

ADVANCES IN DRUG THERAPY 256

MEDICINE 100 YEARS AGO 270

THE SERVICES 268

MEDICAL NEWS 268

LETTERS AND ANSWERS

Treatment of Seborrhoea—Itching Limbs—Coltsfoot—Premaxillary Cysts—Income Tax—Loss of Hair after Air Raids—Bed-pan for Fractured Femur Patients—Declining Population 270

REVIEWS

Medicine and Sociology 246

Neuro-anatomy 246

Care of the Premature Infant 247

Science of Personality 247

OBITUARY

Sir John Macpherson, C.B., M.D. ...267

John M. T. Finney, M.D. 267

L. F. Wilson, M.B. 267

Epidemiology Section 269

LEADING ARTICLES

Mechanics of the Circulation 248

The Scientific Life 249

ANNOTATIONS

Wernicke Syndrome and Vitamin B, Deficiency 249

Hypoglycaemia from Protamine Insulin 250

Haemophilia in Animals 251

Transfusion of Bovine Plasma and Serum 251

CORRESPONDENCE

Megaloblastic Anaemia of Pregnancy and Puerperium. L. S. P. DAVIDSON, M.D., L. J. DAVIS, M.D., and JAMES INNES, M.B.; J. P. MCGOWAN, M.D.; W. SPITZER, M.D. 256

Treatment of Haemophilia. G. GREY TURNER, F.R.C.S. 258

Social Medicine. R. J. S. MCDOWALL, M.D. 258

Trichlorethylene as a General Anaesthetic. C. LANGTON HEWER, M.B. ..258

The Medical Curriculum. C. M. HINDS-HOWELL, M.D.; G. A. CLARK, M.D. 259

Urethral Instrumentation. GORDON BOHN, F.R.C.S. 259

SUPPLEMENT

General Practice: The Gateway to National Health A. WILFRID ADAMS, F.R.C.S. *21*

MEDICAL WAR RELIEF FUND *22*

H.M. FORCES APPOINTMENTS *22*

POSTGRADUATE NEWS *22*

CORRESPONDENCE—*Contd.*

Jung's Psychology. M. FORDHAM, M.B. 260

Scabies. L. J. BACON, M.B.; H. F. LUNN, M.B. 260

Tietze's Disease. P. R. C. EVANS, M.B. 260

Hyperostosis Frontalis Interna. J. MACKAY CRAWFORD, M.B. 261

Enteritis associated with *Giardia lamblia*. J. A. SMITH, M.R.C.S. 261

Treatment of Malaria. S. J. BELLGARD, M.D.; J. COWAN, M.B. 261

Treatment of Threadworms. MAX J. MILLER 262

The Blood in Cancer. J. H. DOUGLAS WEBSTER, M.D. 262

Meningococcal Septicaemia resembling Malaria. F. E. CRAWLEY, M.D. 262

"Removal for Mental Observation." A. W. DOCKAR, M.B.; A. BARHAM CARTER, M.D. 262

A Depression–Hyposexual–Alopecia Syndrome. CLIFFORD ALLEN, M.D. ..263

Body Mechanics. EDGAR CYRIAX, M.D. 263

Atypical Asphyxial Deaths. MUSGRAVE WOODMAN, F.R.C.S. 263

Anaesthetic Death in the Surgery. P. E. WOODROOFE, M.B.; A. D. H. SIMPSON, M.R.C.S. 263

Sterilizing Sulphonamide Powders. W. J. BUCKLAND 264

Complacency in Anaesthetics? J. BLOMFIELD, M.D. 264

Operations and Workmen's Compensation. H. GARDINER, F.R.C.S. 265

Planning Commission's Report. G. G. AIREY, M.R.C.S. 265

Self-medication and the Chemist's Shop. HERMANN LEVY; B. H. KIRMAN, M.D 265

Evils of Long Working Hours. ENID A. M. BRADFORD, B.Sc., A.I.C. 266

Ministerial Propaganda 266

Persistent Blood-giving. EVELYN M. BISKE, M.R.C.S. 266

BRITISH MEDICAL ASSOCIATION, TAVISTOCK SQUARE, LONDON, W.C.

No. 4260, WEEKLY, PRICE 1/6

Copyright

REGISTERED AS A NEWSPAPER

Helps to establish
HABIT TIME

The establishment of Habit Time for bowel movement may be cultivated by the use of 'Petrolagar' Plain.

In the treatment of constipation 'Petrolagar' assists in restoring normal bowel movement by softening the faecal mass.

'Petrolagar' provides a comfortable evacuation which tends to encourage the development of regular Habit Time.

IN TWO VARIETIES
- PLAIN
- PHENOLPHTHALEIN

'Petrolagar'
BRAND PARAFFNI EMULSION Regd.

JOHN WYETH & BROTHER LTD. 25, OLDHILL PLACE, LONDON, N.16.
(Sole distributors for Petrolagar Laboratories Ltd.)

MERSONS EDINBURGH, 8

HAVE DEVISED A SUTURE SILK WHICH IS

NON-CAPILLARY

SERUM-PROOF

NON-IRRITANT

MERSILK is superior to ordinary waxed silk . . . is safe . . . may be steam-sterilised or boiled.

G. F. MERSON LTD. **MERSILK**

SANDOZ PRODUCTS

BASERGIN Tablets, Solution and Ampoules
BELLADENAL Tablets
BELLAFOLINE Tablets, Solution and Ampoules
BELLERGAL Tablets
CALCIBRONAT Tablets, Granules and Ampoules
CALCIUM-SANDOZ Powder, Syrup and Ampoules
CEDILANID Tablets, Solution and Ampoules
DIGILANID Tablets, Solution and Ampoules
FELAMINE Tablets
FEMERGIN Tablets, Solution and Ampoules
LOBELINE Ampoules
NEO-FEMERGIN Tablets, Solution and Ampoules
QUININE-CALCIUM-SANDOZ Ampoules
SANDOPTAL Tablets
SCILLAREN Tablets, Solution and Ampoules
STROPHOSID Ampoules

Full particulars and literature available from:
J. FLINT
SANDOZ PRODUCTS
134, WIGMORE STREET, LONDON, W.1
Tel.: WEL. 8796

BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 29 1942

A CLASSIFICATION OF NERVE INJURIES

BY

H. J. SEDDON, D.M., F.R.C.S.

Nuffield Professor of Orthopaedic Surgery, University of Oxford

In 1863, during the fiercest days of the American Civil War, Dr. W. A. Hammond, Surgeon-General to the Federal Armies, ordered the establishment of a unit for the observation and treatment of injuries of the nervous system. A signal result of this instruction was the appearance in 1864 of a little book by Weir Mitchell, Morehouse, and Keen, *Gunshot Wounds and Other Injuries of Nerves.* This gave an account of the first organized study of nerve injuries, and in it we find not only the most perfect description of causalgia, a condition that will always remain associated with the name of Weir Mitchell, but descriptions of nerve injuries as we see them to-day. These enthusiastic workers laid a good foundation for all that has followed during the succeeding 80 years. But the means of investigation at their disposal were very limited, open operations were rare, and the syndromes described are not quite sufficiently clear-cut to serve as a guide in diagnosis and prognosis.

The enormous number of nerve injuries dealt with during the last war gave to neurologists and surgeons a very clear conception of the results of division of a nerve, but one gets the impression that they were so preoccupied with the repair of nerves so seriously damaged as to require resection and suture that there was hardly time to investigate the great mass of cases in which something less than complete division was present, cases in which spontaneous recovery usually occurred. So far as nerve injuries are concerned this war has been more leisurely.

It is the purpose of this preliminary communication to describe three well-defined types of nerve injury, types so distinctive that it has been found convenient, and indeed necessary, to apply labels to them and make them the basis for a clinico-pathological classification. It might be foolish to claim that every nerve injury can be fitted into this classification, but from the study of 460 cases at the Oxford Centre it has become evident that the majority can be so classified provided one realizes that a combination of lesions is not infrequently present as the result of a single injury.

Clinical Signs of Damage

The clinical manifestations of damage to a peripheral nerve may be considered under two headings.

1. *Those due to Loss of Function:—*
   Efferent: Paralysis of muscles; sudomotor paralysis; pilomotor paralysis; vasomotor paralysis.
   Afferent: Loss of tactile sensibility; loss of pain sensibility; loss of thermal sensibility; loss of joint and postural sensibility; loss of deep sensibility.
2. *Those due to Perversions of Function:—*
   Efferent: Muscle twitching (fasciculation); muscle spasm; abnormal sweating; vasomotor disturbances.
   Afferent: Paraesthesia; apparently spontaneous pain, and pain quite outside the range of normal experience; abnormal responses to heat and cold.

In contemporary clinical practice there is no question whatever that in frequency and importance the first group of phenomena far outweigh the second, and it is with loss of function alone that this classification is concerned.

Although, as has been said, there is a fairly clear understanding among clinicians and experimental workers about the sequence of events following complete anatomical division of a peripheral nerve, there is considerable confusion when we come to examine those numerous cases in which function is lost although anatomical continuity of the nerve is more or less preserved. No clear distinction has been drawn between those intraneural lesions that are followed by complete peripheral degeneration and those in which the rate of recovery is so rapid that degeneration could not possibly have occurred. The well-known term "physiological interruption" conjures up no clear pathological picture, and it is inaccurate in that no interruption of conductivity can properly be called physiological. Similarly, the terms "concussion," "compression," and "contusion" are equally vague; for although they may give a hint of the nature of the cause they do not describe the effect of the injury on the nerve itself.

At a meeting of the Association of Physicians held in April, 1941, I propounded the following classification:

1. Complete anatomical division of a nerve.
2. A "lesion in continuity," in which more or less of the supporting structure of the nerve is preserved but there is nevertheless such disturbance of the nerve fibres that true Wallerian degeneration occurs peripherally.
3. "Transient block."—A minimal lesion producing paralysis that is incomplete more often than not; it is unaccompanied by peripheral degeneration and recovers rapidly and completely.

These three syndromes are well known to neurologists, and discussion centred chiefly on terminology. It may be argued with justification that "lesion in continuity" is ambiguous and might well include "transient block"; for there is no doubt that in transient block the nerve is in continuity. It was therefore suggested by Prof. Henry Cohen that distinctive names should be given to these three types of nerve injury so that confusion might be avoided. He writes:

"Etymologically these words indicate the ideas they are intended to convey, and they have not previously been used—so that the field for them is clear.

"1. *Neurotmesis* (τμῆσις, a 'cutting' which implies a separation of related parts), which describes the state of a nerve that has been completely divided. The injury produces a lesion which is in every sense complete.

"2. *Axonotmesis:* Here the essential lesion is damage to the nerve fibres of such severity that complete peripheral degeneration has followed; and yet the sheath and the more intimate supporting structures of the nerve have not been completely divided, which means that the nerve as a mass of tissue is still in continuity.

"3. *Neurapraxia* (ἀπραξία, non-action) is used to describe those cases in which there is a short-lived paralysis—so short that recovery could not possibly be explained in terms of true regeneration."

The classification is partly morphological, though in each case the clinical behaviour is characteristic. The three types of lesion have been produced experimentally, and work of this kind has contributed considerably to our understanding of them.

It is not proposed here to give more than an outline of the characteristics of the three types, since full descriptions will be published shortly (by me, on neurotmesis, axonotmesis, and neurapraxia; and by W. B. Highet on mixed and incomplete lesions, which are grouped together as *dissociated* paralyses). The classification is presented in brief in the hope that it will prove helpful to clinicians in sorting out their cases of nerve injury.

Neurotmesis (Division of a Nerve)

The clinical and pathological picture presented by complete division of a nerve is so familiar that no more than the briefest description is necessary. At the *site of damage* a swelling which is called a "neuroma" appears at the end of the central stump; it consists of a mass of scar tissue and new nerve fibres in no way different from what is seen in an amputation neuroma. The swelling is sometimes palpable and tender. A swelling also appears at the end of the peripheral stump; it is called a "glioma," is composed of Schwann cells and fibrous tissue, is much smaller than the neuroma, and is rarely palpable clinically.

In the *distribution of the nerve* there is complete sensory and motor paralysis; the affected muscles degenerate and waste, and respond to electrical stimulation with the characteristic reaction of degeneration. The only difficulties in diagnosis are anatomical—in cases where some anomaly in distribution may lead the clinician to believe that the lesion is an incomplete one.

For all practical purposes recovery never occurs in the absence of surgical repair. If suture is followed by regeneration, signs of recovery appear in anatomical order; this is best seen on the motor side, where a regular march of recovery in muscles is often observed. The quality of recovery is always short of perfect, not only because of irreversible degenerative changes in end-organs and muscle but because of confusion at the suture line.

Axonotmesis (Lesion in Continuity)

If a nerve is crushed heavily with forceps all the nerve fibres are broken, but the connective tissue of the nerve survives to some extent; although the gap in the nerve fibres may be quite noticeable at first it is followed by a flowing together of the fibre protoplasm above and below, so that when observed a few minutes after removal of the instrument the lesion, which at first was nothing more than a thin ribbon of connective tissue joining central and peripheral stumps, has filled out to almost normal diameter. There is probably no case in which the connecting function of connective tissue is of greater importance; for it is found that, although the peripheral stump degenerates completely, spontaneous regeneration invariably follows after such an experimental lesion.

Now, it often happens that a nerve is damaged in a somewhat similar way by a "near miss," or pressure from one of the fragments of a fractured bone—in fact, by any injury that fails to divide the nerve completely. It is not to be expected that the accidents of daily life or warfare produce lesions as uniform as those produced in the laboratory: the nature and degree of violence are variable, and so is the extent of the damage done. The lesion exposed at operation may be the familiar fusiform neuroma or nerve spindle: more frequently (as in the experimental lesion) there is little to see beyond slight swelling or constriction, perhaps perineural adhesions and a little thickening of the epineurium. However, in general, the behaviour of lesions of this type is characteristic. The lesion is called "axonotmesis" because its essential feature is complete interruption of nerve fibres with preservation of more or less of the supporting structure of the nerve. After a period of several weeks or a few months new fibres manage to make their way through the scar tissue at the site of the lesion, and regeneration then proceeds in an anatomically orderly fashion down the peripheral stump. In experimental animals (rabbits) the rate of regeneration is faster after axonotmesis than after neurotmesis, but we are not yet sure that this is the case in man, although there is some evidence to suggest it. What is quite certain is that functional recovery is far better, and it is reasonable to suppose that this is due to the growth of fibres into their old pathways; some of them may go astray, but the majority are guided by the endoneurium and perineurium into their old channels. Everyone is familiar with the excellent spontaneous recovery that generally follows radial paralysis complicating fractures of the humerus, and this is the best example of axonotmesis in clinical practice.

It cannot be emphasized too strongly that there is no clinical difference whatever between the paralysis resulting from axonotmesis and that following neurotmesis. Seeing that peripheral degeneration is complete one could not possibly expect to find any, and indeed there is none. How, then, are the two conditions to be distinguished? There are three possible ways.

Experience teaches us that certain injuries are likely to cause neurotmesis, while others are more likely to cause axonotmesis. Radial paralysis complicating a gunshot wound of the arm is likely to be due to neurotmesis, in which case recovery will not occur unless the nerve is sutured. On the other hand, a closed fracture of the humerus involving the radial nerve almost always produces axonotmesis: by the time treatment of the fracture is completed there is generally some sign of recovery. On can therefore make a shrewd guess from knowledge of the nature of the injury. The second way is to wait until sufficient time has elapsed for spontaneous regeneration to occur. If signs of recovery fail to appear, then neurotmesis may be suspected and the nerve should be explored. This has been the general policy in the past, but the time of waiting has been too long; it is clear that if the lesion is in fact neurotmesis valuable months will have been wasted. No harm comes from exploring a nerve, and it has become our practice to carry out exploration in every case in which regeneration has not appeared within the calculated time.* This brings us to the third and only precise method—i.e., exploration. Riddoch has repeatedly emphasized that we should regard operative exposure of the lesion as a necessary step in the establishment of the diagnosis. Provided that the operation is carried out by a competent surgeon who is familiar with every detail of the neurological picture, and provided his approach to the nerve lesion itself is conservative rather than radical, exploration is a commendable procedure. It may reveal a somewhat unexpected neurotmesis; it may reveal axonotmesis, in which case the surgeon and the patient know what to expect—i.e., spontaneous regeneration.

Neurapraxia (Transient Block)

Recovery from certain nerve injuries is remarkably rapid—indeed, so speedy that it cannot possibly be explained in terms of axonal regeneration. Lesions of this type, like axonotmesis, may be produced by any injury that does not actually sever the nerve, but the violence is not of a high order. Tourniquet paralysis, Saturday-night paralysis, crutch paralysis, are all familiar examples—though sometimes these injuries may be sufficient to produce true degenerative changes.

Since the condition is essentially a clinical syndrome it is best to describe its clinical characteristics first: (*a*) the paralysis is predominantly motor; (*b*) there is little wasting; the electrical reactions of the muscle persist unchanged; (*c*) subjective sensory disturbances—numbness, tingling, pins-and-needles, burning—are common; (*d*) objective sensory disturbances are generally partial, often minimal, so far as touch, pain, heat, and cold are concerned; (*e*) loss of postural sensibility and vibration sense are common; (*f*) loss of sweating is unusual. Muscle tone is said to be retained, but this has not been our experience.

It is clear, then, that the lesion is a dissociated one: the motor and proprioceptive fibres suffer more than those subserving other functions, and there is a physiological explanation for this. Recovery, which can be predicted with absolute confidence if examination reveals this syndrome, is fairly rapid, beginning usually after two to three weeks and complete within six to eight—though I have seen a few cases in which complete restoration of function was delayed until the fourth month. The progress of recovery is irregular;

* A paper dealing with rates of regeneration will be published within the next few months.

it follows no anatomical order—it may appear suddenly throughout the whole distribution of the affected nerve, and resembles nothing so much as the wearing off of the effects of local anaesthesia. In the few cases in which it is delayed it is still much more rapid than the fastest recovery from axonotmesis, and would demand a rate of growth of axons quite unknown in clinical or laboratory experience. Furthermore, the preservation of normal excitability of muscles is clear evidence against Wallerian degeneration of the nerve below the lesion, and we now have evidence on the motor side that the affected nerve is not only capable of conducting impulses but in fact does so, though no contraction of the muscle can be detected clinically. There is therefore a disturbance of conduction (which can be produced experimentally) that impedes the transmission of impulses but does not destroy the axon. Recovery is always perfect.

Neurapraxia is a non-committal but adequate description of this non-functioning of a nerve. Neurapraxia is produced by cocainization of a nerve, by mild degrees of refrigeration, and by slight injury.

Comment

It is obvious that by no means all nerve injuries can be classified under these simple headings; the accidents that produce them are not uniform in their effects unless the violence is great. An injury may affect the fibres of a nerve in varying degree, and the clinical picture will then be more complex. A lesion may be made up by a combination of any of the following: (*a*) neurotmesis; (*b*) axonotmesis; (*c*) neurapraxia; (*d*) normal fibres.

Indeed, neurapraxia is a lesion in which a certain number of normally functioning fibres are always present. Leaving this aside, there are no fewer than eleven possible combinations of these lesions, each with its own clinical characteristics! In complicated lesions of the brachial plexus, for example, the picture may be so mixed that precise diagnosis is impossible, though there is often plenty of scope for light-hearted speculation. We have seen almost every one of the possible combinations, and do claim that none of the phenomena of interruption of a nerve that we have so far encountered required other explanation. This is a very difficult field of clinical inquiry, and it is not proposed to discuss it here, seeing that the various combinations of lesions form the subject of a paper that will shortly be published by W. B. Highet, who has investigated all the cases of dissociated paralysis seen at the Oxford Centre since its inception in June, 1940.

CAROTINAEMIA

BY

S. ALMOND, M.D., M.R.C.P.

Honorary Assistant Physician, Salford Royal Hospital, Honorary Physician, Manchester Victoria Memorial Jewish Hospital; Consultant Physician, Leigh Infirmary

AND

R. F. L. LOGAN, M.B., Ch.B.

Resident Medical Officer, Salford Royal Hospital

We have recently observed 5 cases showing pigmentation of the skin pronounced enough to warrant provisional diagnoses, by the attending practitioners, of "jaundice," "pernicious anaemia," "haemolytic anaemia," and "cholelithiasis." This pigmentation can only be properly described as "carroty," and while in the mild cases it is most obvious in the naso-labial folds and the palms of the hands, in the more advanced cases it is a generalized body tanning. The condition is due to the excessive consumption of carrots, though it has been recorded when other lipochrome foods are eaten in quantity.

The Literature of Carotinaemia

The term "carotinaemia" for the orange pigmentation of the skin observed after the excessive consumption of carrots and other vegetables was first applied by Hess and Myers in 1919. The observation of this skin discoloration in diabetics whose diet consisted mainly of foods rich in yellow lipochrome—fruit, vegetables, butter, and eggs—was made by von Noorden (1907), who considered the condition to be a diabetic manifestation. Moro (1908) noted that normal infants developed a similar pigmentation when carrots were added to the diet. Van den Bergh and Snapper (1913) showed that there were lipochrome pigments circulating in the blood of diabetic patients with the orange pigmentation, and that these pigments were identical spectroscopically with those of carrots and other vegetables. Salomon (1919) referred to this pseudo-icterus in non-diabetic patients whose diet largely consisted of the foods mentioned, and the gradual disappearance of this pigmentation with abstinence from such foods. Stoeltzner (1919), commenting on Kaupe's observation (1919) that nurslings lost their yellow coloration when their high carrot diet was stopped, observed that the number of similar children had increased during the last war. He called it a "pseudo-icterus" and thought a high tomato diet might produce a similar pigmentation.

Greene and Blackford (1926) and Stoner (1928) discussed the condition under the heading of "carotinaemia." Boeck and Yater (1929) used the term "xanthaemia" for the circulation in the blood of lipochrome pigments (thereby excluding bile pigments) and "xanthosis" for the visible presence of these yellow pigments in the skin. They found xanthaemia in all their nephritics and in most diabetics, and even in most "normal" cases examined. However, xanthosis was present in only 10% of the renal and diabetic cases and in only 3% of other cases. All these patients with stained skin had eaten excessively of lipochromic foods.

Stannus (1929) called the discoloration "hyperlipochromia," and concluded that it resulted from the failure to oxidize the carotinoid pigments in the body. He first reported carotinaemia in myxoedema, and Wendt (1935) noted the condition in some cretins. Bomford (1938) confirmed the presence of carotinaemia in some cases of myxoedema on a normal diet. On thyroid medication the lipochrome index fell to normal. He remarks that as the colour of cream is due to lipochromes, the description of the myxoedematous facies as a "strawberry and cream" complexion is not without justification.

The Present Series of Cases

Our interest in carotinaemia was first aroused by the visit of a clerk's wife on account of "jaundice," though her sclera was contrastingly white. In the spring months further cases were referred as "pernicious anaemia" and "haemolytic anaemia"; the woman with "gall-stones" was visiting her husband, an in-patient with acute nephritis, when the ward sister drew our attention to her carroty complexion. None of these patients had symptoms of ill-health, though the curious discoloration was a source of anxiety.

Careful histories were extracted to find the actual pounds of carrots consumed per week (see Table). As kitchen standards

Table showing Amount of Carrots consumed Weekly

Occupation of Husband	Provisional Diagnosis (own Doctor)	Raw Carrots		Other Veg. and Eggs	Icteric Index	Serum Bilirubin (mg./100 c.cm.)	On Normal Diet Fading		Other Medical Conditions
		lb. per Week	Threshold Months				First Noticed (Weeks)	Complete (Weeks)	
Lorry-driver	Gall-stones	8	8	—	10	0·1	3	6	Cholecystectomy, 1932
Clerk ..	Jaundice	6	6	+++	8	0·3	2	4	Microcytic anaemia
Shop-keeper	Pernicious anaemia	5	7	+	12	0·6	2	4	Mitral stenosis
Corporal	Haemolytic anaemia	4	8	+	8	0·1	2	5	Microcytic anaemia
Baby ..		breast-fed	2	—	—	—	4	8	Healthy

of quantity are given vaguely in pinches, spoons, and cups, we sought and obtained the number and size of the carrots, from which a correct estimate was made. These weights apply only to the raw carrots, as the other vegetables and cooked carrots were always eaten in pre-war helpings. During the

winter carrots were cheap and easily obtainable, and "besides, they were so nice to munch." The lorry-driver's wife had been told "carrots were full of vitamins." The clerk grew so many carrots on his allotment that his wife felt she had to eat them. She liked the clean taste left in her mouth so much that she invariably carried one about in her pocket. Since June of last year the corporal's wife used to munch carrots, especially while preparing the family meals, in order to increase her vitamin intake during her period of gestation. A healthy baby was born at Christmas and thrived on the breast. It had no other treatment. In February the corporal noticed his wife and baby were carroty and sought his doctor's advice. Jaundice was diagnosed and the breast dethroned by the bottle. On a light diet and milk feeds the pigmentation gradually faded.

The time taken for saturation before the carroty skin was first noticed is tabulated as the threshold months. Each patient was thoroughly investigated for diseases which may have provided other factors; but they were quite healthy women, apart from one moderate case of mitral stenosis and the almost invariable hypochromic anaemia so prevalent in this area. These patriots of the "Kitchen Front" were congratulated on their heroic consumption both of carrots and of propaganda, and were asked to return to their basic helpings of vegetables, including carrots. On this moderation (it was not abstinence) the times in weeks of initial and then complete fading were noted.

Our threshold value corresponds approximately to that of a patient, quoted by Wood and Agnor (1941), who ate two carrots daily for a year. Kaupe's (1919) finding of carotinaemia in babies weaned on carrot soup, the lipochrome content of which must necessarily have been small, is in harmony with our baby's susceptibility in developing skin pigmentation after only two months on the breast milk of its carotinaemic mother. This is believed to be the first case reported of carotinaemia from the breast milk of an affected mother.

Laboratory Investigations

The routine estimations of icteric index and serum bilirubin were carried out in all cases. These revealed an obviously "jaundiced" serum of a high icteric index (on colour comparison with the potassium dichromate standard 1/10,000 dilution) but a serum bilirubin within normal limits. Obviously the orange colour was not due to bile pigment. However, the lipochromes are soluble in petroleum ether and the bile pigment in absolute alcohol, which will also precipitate the proteins in the serum.

This fact forms the basis of the test of Greene and Blackford, which we refer to as the three-layer test, to differentiate carotinaemia from jaundice. Equal quantities of serum, alcohol, and petroleum ether are shaken up in a tube. This may be left to settle, as the volatile petroleum ether, with its dissolved lipochromes, rises to the top as a distinct layer. If lipochromes are present in abnormal amount this top layer will show a definite yellow tinge which is pathognomonic of carotinaemia. The depth of colour may be compared with the potassium dichromate standard to give its lipochrome index. However, it is better to centrifuge the mixture in the tube. The precipitated proteins spin down to the bottom as a white curd, covered by the middle band of absolute alcohol with its dissolved bile pigments, on which the "true icteric index," or bile index, can be estimated against the dichromate standard. If this middle alcohol band is excessively yellow and is covered by a clear petroleum layer, then the sandwich is jaundiced and the bile index will equal the icteric index.

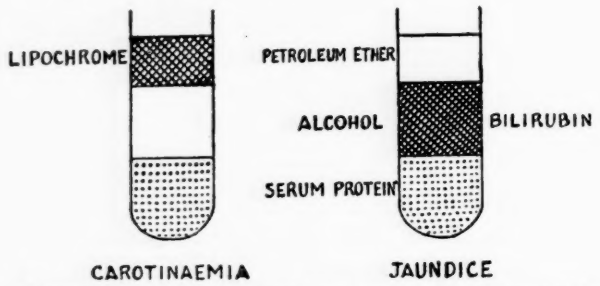


Diagram illustrating the three-layer test for the differentiation of carotinaemia from jaundice.

$$\underset{\text{(on whole serum)}}{\textit{Icteric index}} = \underset{\text{(on alcohol layer)}}{\textit{Bile index}} + \underset{\text{(on ether fraction)}}{\textit{Lipochrome index}}$$

In a hypothetical case of jaundice and carotinaemia both layers will be quite yellow, and the degree of each pigmentation can then be estimated separately.

Carotene is the yellow colouring matter—the lipochrome—of carrots, spinach, palm oil, and nettles. It is a highly unsaturated hydrocarbon, $C_{40}H_{56}$, which exists in three forms—alpha-, beta-, and gamma-carotenes. These can be separated by filtering a light petroleum solution through a Tswett column of calcium hydroxide. Each form adsorbs out of solution at a different layer in the column. All three forms are precursors of vitamin A, but owing to its internal pattern one molecule of beta-carotene yields two molecules of the vitamin, while the alpha and gamma forms produce only one molecule. Thus the beta form has twice the physiological activity of alpha- and gamma-carotenes. Natural products, however, contain much more beta- than alpha-carotene and little, if any, of the gamma form. The isomer of carotene is lycopene, which is the colouring matter of tomatoes, rose hips, and bittersweet berries, but is inactive physiologically in not forming vitamin A. Carotene is the principal though not the only lipochrome in human serum. It is always associated with its hydroxyl derivative, a xanthophyll. Lutein is the xanthophyll of alpha-carotene, and is the lipochrome in egg yolk and green leaves. Thus the term "xanthaemia," of Boeck and Yater (1929) is more accurate than the popular carotinaemia.

The absorption of the lipochromes from the bowel is stated by Wood and Agnor (1941) to depend on the presence of dietary fat and the bile acids with which it is absorbed as a water-soluble diffusible complex. Curtis and Ballmer (1939) have shown that liquid paraffin interfered with this transport of carotene across the epithelium of the intestine. In the plasma the carotene is probably adsorbed to the albumin molecule and carried in colloidal suspension. The plasma proteins can be precipitated down by absolute alcohol, which itself dissolves bile pigments, while the lipochromes are soluble in petroleum ether, which floats lightly as a separate layer above the alcohol. This provides the basis for the three-layer test of Greene and Blackford. The conversion of carotene into vitamin A probably takes place in the liver.

Ralli *et al.* (1936) showed that the liver of a carotinaemic diabetic contained an increased amount of carotene. Pariente *et al.* (1936) theorized that in diabetes the conversion of carotene to vitamin A was impeded and that this resulted in a damming up of carotene in the liver and a diminished absorption from the blood. They neglected the additional factor of the high lipochromic diet usual in diabetics.

According to Wood and Agnor (1941), any excess of carotene is either destroyed or excreted via the sweat. They state that when excretion is unusually heavy the carotene is reabsorbed by the horny layer of the skin. Palmer and Kempster (1919) found the lipochromes in fowls in the rete malpighii and cornified layers of the skin. Greene and Blackford (1926) observed the concentration of pigment in the naso-labial folds, where sebaceous glands abound, and in the palms and soles, where cornified skin is thickest. We find that the soles of Lancashire housewives are undistinguished, but that the palms of our hospital cooks, after scraping carrots for dinner, were stained like T.N.T. workers. However, this direct staining from handling carrots could be washed off almost completely—in contrast with that from excessive intake, which was undiminished by washing. In our cases, in addition to the naso-labial folds and palms, the rest of the skin was almost uniformly tanned, but the sclera was contrastingly white. This immunity of the sclera in carotinaemia is the chief clinical sign in differentiating it from jaundice. The colour of the skin and the details of food intake are additional factors in clinical diagnosis.

Several of our patients noticed a deep orange colour in the urine. Attempted extraction of the colour with petroleum ether was unsuccessful, and no typical absorption bands were found spectroscopically.

Boeck and Yater (1929) discuss the wide variation in the appearance of xanthosis and xanthaemia in individuals on

similar diets. To account for this, they believe that the rates of oxidation and excretion must vary widely. Bernheim (1926) fed large quantities of carrots to 3 patients, who quickly produced a high icteric index, which, however, fell to normal within 12 hours. In our cases the rate of metabolism seemed to be remarkably constant in the different individuals. The threshold quantity appeared to be a minimum of 4 lb. of excess carrots per week for a minimum period of seven months before skin pigmentation became visible. The rate of fading appeared to be equally constant once they returned to an average diet. Fading was first noticed in a minimum of two weeks and was complete within eight weeks. In view of Bernheim's finding of the rapid disappearance from the blood of excess lipochromes within 12 hours, it would seem that above the threshold quantity the body is unable to oxidize or excrete all the lipochrome, so that some pigment is slowly accumulating. The capacity of the body to eliminate lipochromes must be well above the normal requirements, as it takes a minimum of six months' accumulation before the high threshold is reached on such abnormal intake and before skin pigmentation is noticeable.

The findings of the remarkably constant threshold in the accumulation of pigment and of the steady rate of fading in normal individuals support the theories of diminished conversion of carotene to vitamin A in the liver of diabetics and poor urinary excretion in nephritics, as in both diseases carotinaemia occurs more frequently than in health.

Summary

Carotinaemia is a carroty pigmentation of the naso-labial folds and palms when mild and, when marked, a general body tanning except in the sclera, which distinguishes it clinically from jaundice. It is due to the excessive consumption of carrots and other lipochromic foods. The patients are healthy and do not require treatment apart from reduction to average consumption.

Four cases of carotinaemia are described in normal women after eating more than the threshold quantity of 4 lb. of raw carrots per week for a minimum period of seven months.

A baby fed only on the breast of its carotinaemic mother developed the condition within two months. This is believed to be the first case described.

The simple three-layer test of Greene and Blackford to differentiate between carotinaemia and jaundice is described.

We are indebted to Drs. S. Smithson and M. C. Welsh for allowing us to see and investigate their cases. We wish to thank especially Dr. M. L. Thomson for permission to investigate the case of the infant of the carotinaemic mother.

BIBLIOGRAPHY

Bernheim, A. R. (1926). *Arch. Path. lab. Med.*, **1**, 747.
Bernthsen, A. (1941). *Textbook of Organic Chemistry*. London and Glasgow.
Boeck, W. C., and Yater, W. M. (1929). *J. lab. clin. Med.*, **14**, 1129.
Bomford, R. (1938). *Quart. J. Med.*, n.s., **7**, 495.
Curtis, A. C., and Ballmer, R. S. (1939). *J. Amer. med. Ass.*, **113**, 1785.
Greene, C. H., and Blackford, L. M. (1926). *Med. Clin. N. Amer.*, **10**, 733.
Hess, A. F., and Myers, V. C. (1919). *J. Amer. med. Ass.*, **73**, 1743.
Kaupe, W. (1919). *Münch. med. Wschr.*, **66**, 330.
Moro, E. (1908). Ibid., **55**, 1637.
Palmer, L. S., and Kempster, H. L. (1919). *J. biol. Chem.*, **39**, 313.
Pariente, A. C., Present, C. H., and Ralli, E. P. (1936). *Amer. J. med. Sci.*, **192**, 365.
Ralli, E. P., Pariente, A. C., Brandaleone, H., and Davidson, S. (1936). *J. Amer. med. Ass.*, **106**, 1975.
Salomon, H. (1919). *Münch. med. Wschr.*, **66**, 564.
Stannus, H. S. (1929). *Int. Clin.*, 39th ser., **1**, 146.
Stoeltzner, W. (1919). *Münch. med. Wschr.*, **66**, 419.
Stoner, W. C. (1928). *Amer. J. med. Sci.*, **175**, 31.
van den Bergh, A. A. H., and Snapper, J. (1913). *Dtsch. Arch. klin. Med.*, **110**, 540.
von Noorden, Carl H. (1907). *Die Zuckerkrankheit*, 4th ed., p. 149, A. Hirschwald, Berlin.
Wendt, H. (1935). *Münch. med. Wschr.*, **82**, 1679.
Wood, R. H., and Agnor, E. B. (1941). *J. med. Ass. Georgia*, **30**, 239.

W. E. Snell (*Tubercle*, 1942, **23**, 101) maintains that garden work is the main form of occupation for sanatorium patients for the following principal reasons: (1) it provides controlled exercise for patients under open-air conditions, and thus hardens them for return to a working life; (2) it relieves the boredom of institutional life and should provide the patient with a mental interest; and (3) the patient's labour theoretically provides some return to the institution. In any sanatorium of 300 beds about 50 patients will be available for garden work, consisting of the following groups of cases: (1) early or pleural cases for which no collapse therapy is indicated; (2) patients undergoing artificial pneumothorax and those convalescent from thoracoplasty; and (3) patients not suitable for artificial pneumothorax but whose general condition is good.

BEE-STINGS IN KENYA COLONY

BY

A. J. JEX-BLAKE, M.D., F.R.C.P.

East Africa is a good place for studying the effects of bee-stings, because people living there are stung more often than those in England. This is in part because the common native bee, *Apis mellifica adansoni*, is more savage and eager to attack than the honey-bee of Europe, *Apis mellifica*, its near relative—for example, an expert bee-keeper of my acquaintance would often get as many as 50 stings a day while looking after her few hives of native bees—and in part because the bee population is large, the native inhabitants being apt to put up barrels, hollow pieces of tree-trunks, boxes, and other contraptions in trees anywhere and everywhere for the wild bees to hive in, the honey being used for beer-making. Further, these bees swarm all the year round, so that there is never a day when flying or settled swarms may not be met with out of doors or indoors. Finally, many East African houses, especially those that have been unoccupied for a time, acquire nests of bees in roofs, hollow walls, or under the floors that are very hard to get rid of when the house is occupied again. When they do attack, nests, hives, or swarms of native bees are apt to do so on the heroic scale. This is illustrated by the following 3 cases occurring in European settlers:

Cases of Massive Stinging: Recovery

Case 1.—A small man aged 75 was attacked by a swarm of bees in his garden. Between 200 and 400 stings were removed from his face and neck, and he was given an intravenous injection of 2 pints of 2% sodium bicarbonate solution. He showed no reaction from either the stings or the treatment, and no severe signs or symptoms.

Case 2.—A man aged 64 was attacked by swarms of bees and heavily stung about the face, neck, and hands. In 2 or 3 minutes he was overcome by violent diarrhoea and vomiting, and soon after that became unconscious. He was presently rescued and came to himself quickly. His face was so beset with upstanding bee-stings that he said he looked as if he had not shaved for 3 or 4 days. Over 300 bee-stings were extracted, and ammonia solution was dabbed on. He slept well with a sedative, and next day, apart from a little thickening and itching of the skin of the face and hands, felt quite all right.

Case 3.—A young woman set upon by swarms of bees was badly stung; she had attacks of diarrhoea and vomiting, and was rescued in a fainting condition. The number of stings extracted from her scalp, face, neck, chest, back, arms, and legs was at least 500, probably more—an hour and a half's work, including extraction of a sting from the very back of the tongue. Fine curved entomological forceps were used, and care was taken not to squeeze the venom-sacs during extraction. Dilute ammonia was applied, and the patient required a sleeping-draught and morphine. She kept to her bed next day and then recovered rapidly.

The numbers of the stings removed in these instances are those estimated by the medical men who removed them or by other observers, and there is no reason to believe that they have been exaggerated. The amount of venom injected by a single bee-sting is said by Phisalix (1922) to be 0.33 mg.; its active constituent is a protein. Case 1 suffered no more than a severe but passing inconvenience from the stings and must have had an exceptionally high tolerance of or immunity to bee-stings; Cases 2 and 3 can probably be taken as having the normal degree (if there is such a thing) of sensitiveness thereto.

Two Fatal Cases

The following two cases illustrate the fact that a man who has suffered no more than the normal transient local pain and swelling after bee-stings all his life may suddenly become hypersensitive to bee venom and be very near to death or even die when stung again.

Case 4.—A healthy man aged 45, passed fit for insurance 6 weeks previously, was stung 4 or 5 times while driving a swarm of bees out of his veranda; these stings gave rise to the usual

transient painful swellings, as stings had done in previous years, but to no general symptoms. A fortnight later he was attacked by a swarm of bees while walking along a road, and was again stung on the face 4 or 5 times; he ran away, and in about 2 minutes collapsed and died. Artificial respiration, continued for an hour, was without effect.

Case 5.—This patient, a man aged 55, owned and lived on a sisal farm which chanced to have a particularly large bee population. For 20 years he had been stung at least a dozen times a year with no ill effects beyond slight and passing local swellings. A sudden change for the worse took place in this state of affairs. One day, while playing bridge on a veranda, he was stung in the leg. He felt very ill, collapsed in 2 or 3 minutes, was unconscious, cyanosed, and pulseless for 10 minutes, passed water and motions, and struggled violently on coming to. Twenty minutes later he was well enough to drive himself home in his car. During the next 9 months he had 10 more similar attacks on being stung; each attack was said to be more severe than the previous one. The last attack but one followed a sting on the forehead; the patient walked into the house, collapsed in half a minute, and was cyanosed and pulseless for 10 minutes. Two hypodermic injections of strychnine were given and the pulse slowly returned; while still unconscious the patient passed water and motions, as always happened in these attacks, had a violent rigor, and dripped with perspiration. He was placed on a couch and slept for 4 or 5 hours, waking up perfectly well. The eleventh and last attack followed a sting in the neck, and proved fatal in about 15 minutes.

Discussion

It seems reasonable to assume that in Case 4 the patient was sensitized or rendered hypersensitive to bee venom by the 4 or 5 stings he received a fortnight before his death. But in Case 5 there is, unfortunately, nothing to show why the patient suddenly became hypersensitive to bee venom 9 months before he died, after having been quite insensitive to it for 20 years. The sensitization in Case 4 was specific; in Case 5 it may have been specific, but the possibility of non-specific sensitization to bee venom (Foulkes, 1939; Bray, 1934; Oriel, 1936) should not be overlooked.

An explanation of sudden death occurring after wasp- or bee-stings often met with in medical literature (Dyke, 1941; Barber, 1941; Cummins, 1939) is that the sting has chanced to puncture a vein in the dermis, so that some of the venom enters the circulation direct instead of being fixed and destroyed by the skin. The cases detailed above lend no support to this notion. In Case 5 one cannot believe that the bees should have missed the veins a dozen times a year for 20 years and in the ensuing 9 months punctured them 11 times in succession. And in Cases 1, 2, and 3 it is hard to imagine that not one out of so many hundreds of stings should have struck a vein in the dermis. In fact, this theory of venepuncture is superfluous. A better explanation of such sudden deaths can be given in terms of idiosyncrasy, hypersensitiveness, allergy, or anaphylaxis. If the signs and symptoms observed in severe or fatal cases of bee-stings are compared with those recorded (Bray, 1934; Lamson, 1924) in severe or fatal cases of serum disease, as in the accompanying Table, the two are seen to be nearly identical, and death in each case can properly be set down to anaphylactic shock.

Severe Bee-stings	Severe Serum Disease
Restlessness, apprehension	Restlessness, apprehension
Unconsciousness	Vision completely lost
	Unconsciousness
General Symptoms	
Erythema, pallor	Erythema, pallor
Urticaria	Urticaria
Giant urticaria	Large confluent wheals
Itching, local or general	Itching, local or general
Numbness, tingling	Numbness, tingling
Generalized burning pain	Generalized sudden pain
Sweating	
Muscular System	
Uncontrollable twitching	Twitching of face
Muscular spasms	Spasms of arms and legs
Convulsions, rigor	Severe convulsions, tonic and clonic
Transient paralyses of eye, pharynx, limbs	Opisthotonos
	Dilatation of pupils
Intense weakness	
Heart and Lungs	
Anginal pain in chest	Pain in chest
Heart failure	Heart failure, syncope
Heart beating after cessation of respiration	Heart beating for 3 to 15 minutes after cessation of respiration
Cyanosis	Cyanosis
Acute dyspnoea	Acute dyspnoea, choking cough
Cheyne-Stokes breathing	Typical attack of asthma
Crowing respiration	Respiratory failure
Respiratory failure	
Digestive Tract	
Violent diarrhoea and vomiting	Violent diarrhoea and vomiting
Loss of sphincter control	Loss of sphincter control
Inability to swallow	

Summary

The frequency of bee-stings in Kenya Colony is noted. Three cases of multiple bee-stings with recovery and 2 fatal cases are recorded.

The suggestion that fatal cases occur when the sting penetrates a vein is discredited.

It is argued that death in fatal cases of bee-stings is due to anaphylactic shock, as it is in fatal cases of serum disease.

My thanks are gratefully offered to Drs. G. V. W. Anderson, J. A. Carman, P. J. Curtis, R. A. W. Proctor, and V. G. L. van Someren for much of the information given above.

References

Barber, H. W. (1941). *Lancet*, **2**, 410.
Bray, G. W. (1934). *Recent Advances in Allergy*, 2nd ed., London.
Cummins, S. L. (1939). *British Medical Journal*, **2**, 252.
Dyke, S. C. (1941). *Lancet*, **2**, 307.
Foulkes, R. K. (1939). *British Medical Journal*, **2**, 471.
Lamson, R. W. (1924). *J. Amer. med. Ass.*, **82**, 1091.
Oriel, G. H. (1936). *Brit. Encycl. med. Pract.*, **1**, 303, London.
Phisalix, M. (1922). *Animaux Venimeux et Venins*, **1**, 359.

INDIRECT RADIOTHERAPY*

BY

W. VIGNAL, M.D.Paris

Lieut.-Colonel, Fighting French Forces

Radiotherapy as ordinarily practised exerts a local destructive effect. Indirect radiotherapy produces good results by its effects on function, especially that of the sympathetic and glandular systems. Radiations act very differently on cells *in vitro* and *in vivo*. Their effects cannot be measured solely by the morphological changes which they produce; other less-known modifications have a great field of usefulness in treatment.

Cardiovascular Disorders

In *arterial hypertension*, which Vaquez showed to be due to excessive development of the suprarenal glands, irradiation of the suprarenal capsules has been widely practised since 1913. Generally speaking, in chronic constitutional hypertension with no evidence of nephritis or of any other assignable cause, irradiation does not reduce the blood pressure any more readily than do the simpler methods of rest and diet. On the other hand, it often greatly relieves the functional symptoms, such as headache, vertigo, spasm, and muscae volitantes. Similar results are obtainable with high-frequency current. Moreover, exacerbations of hypertension are quickly controlled by irradiation of the suprarenals, though the underlying condition is unaltered. The dosage is comparatively slight, and no change in the suprarenal tissues has been observed at necropsy. These apparently contradictory observations may be explained by Bard's differentiation of arterial hypertension into several varieties. Some of these he suggests are compensatory either for some known disorder like nephritis or for an unknown disturbance. To reverse the physiological changes, the cause, whatever it is, must be treated. On the other hand, hypertension due to a derangement of the mechanism controlling arterio-constriction is amenable to suprarenal irradiation.

Thrombo-arteritis obliterans falls into two classes: local, due to compression, embolism, or localized thrombosis; and general. Local forms may respond to various other kinds of treatment but never to radiotherapy; in the general group, cases which develop rapidly from infection and septicaemia do not respond to irradiation, but chronic and subacute cases

* Translation abridged for publication.

—for instance, in young or old persons or in diabetics—can be notably improved and sometimes clinically cured. The results depend on the stage at which the lesions are treated. The best time for treatment is naturally when the symptoms are still at their mildest and the vascular system can respond to irradiation of the sympathetic nervous system.

Thrombo-arteritis generally attacks a large artery and always sets up a reflex vasoconstriction of the collateral circulation. The aim of treatment is not to restore circulation in the artery, for this cannot yet be done; it is to suppress the vasoconstrictor reflex and so allow the collateral circulation to continue to supply blood to the limb. Accordingly, irradiation is applied to the suprarenal area—i.e., between D 10 and L 2; to the periaortic plexus, which surrounds the iliac arteries; and to Scarpa's triangles and the popliteal spaces ("*carrefours arteriels*"). The pain nearly always disappears, though on the night after the first or second treatment the symptoms are aggravated. When the pain is associated with gangrene, radiotherapy is only palliative. On the other hand, irradiation acts on the vasomotor symptoms almost at once. The patient often notices during the first treatment a feeling of heat, which can be felt by the hand; the limb can also be much more readily warmed in bed or by an external source of heat. The oscillometric index hardly ever varies to correspond, and the claudication is reduced but never entirely banished.

On *trophic disorders and gangrene*, irradiation has an undeniable but an unreliable effect. The least favourable indications are torpid wounds and chronic gangrene in old persons. The results have, of course, to be assessed with discrimination. In sphacelus and gangrene the pain due to the arteritis is relieved, and frequently the gangrenous process is arrested and a drainage channel is formed; sometimes the condition may even clear up. In other cases the local pain due to the gangrene persists in spite of a strong impression that the process has been stopped or slowed. The limb will then have to be amputated; but the patient's condition may be much improved, as the operation can be performed under better conditions, sparing a larger portion of the limb.

Arteritis in old patients, especially when the calcified arteries are visible in the radiograph, gives the least encouraging results. Juvenile arteritis is the most favourable indication. In *diabetic* patients the most important requirement is to reduce the blood sugar. The prognosis for *moist gangrene* is always very bad.

Irradiation of the sympathetic also produces several effects apart from the changes in the pathological condition. In *Raynaud's disease* it has little action by itself but reinforces the action of diathermy. When the cervical region is included it will often clear up vasomotor symptoms due to *trauma* in which disturbance of the sympathetic balance produces vasoconstriction. Possibly it might have an equally beneficial effect on *pathological vasodilatation*, as in erythromelalgia: its action is polyvalent, and it produces always the effect opposite to that of the pathological condition.

There exists in most *cardiac disorders* a functional element which is susceptible to irradiation. Several workers, including Pruche and Bienvenue, give a small exciting dose to an area of the cervico-dorsal spine at the level of the stellate ganglion. The results are a toning-up of the myocardium, reinforcement of the action of digitalis, and diminution of the tachycardia; but no definite conclusion can yet be drawn from the relatively small number of cases treated.

Dermatoses

Gouin and Bienvenue found that the irradiation of *primary warts* would clear up secondary warts at a considerable distance. They suggest that the rays excite the nerve endings of the skin to produce, by way of the afferent fibres of the vegetative system, sympathetic reflex actions which modify the lesion. This theory does not seem to apply to the particular instance of warts, but has been borne out by their results in other skin disorders. Since 1924 they have treated *Wilson's lichen planus* by superficial irradiation of the interscapular region, the rays being centred on D 4 for lesions of the upper and on D 10 for lesions of the lower limbs. They give only one application, and if it fails they do not try another for three weeks. The evening after the treatment the pruritus is often aggravated for two or three hours, but by the next morning it completely disappears; during the next three or four weeks the papules flake off and disappear. Pautrier of Strasbourg uses a method which he calls medullary radiotherapy: he employs thicker filtration, a higher kilovoltage, and a larger dosage, given in two parts at intervals of three days. Broadly speaking, Gouin and Bienvenue limit the action to the cutaneous afferent fibres, while Pautrier's aim is to irradiate the roots or medullary ganglia of the visceral sympathetic system. His method is perhaps better adapted to cases of longer standing.

In *supramalleolar erythrocyanosis* Gouin and Bienvenue use either spinal or axial irradiation. When the skin disorder is associated with others, such as dysmenorrhoea or acne, they irradiate the arterial *carrefours*; if the menstrual trouble is predominant, they begin by spinal irradiation and irradiate the *carrefours* three weeks afterwards. The duration of *chilblains* can be considerably shortened by irradiation of the *carrefours*, and they may be prevented from recurring. If they have ulcerated before cicatrizing they will secrete copiously. They clear up a fortnight after irradiation.

Acrocyanosis is treated by irradiation of the *carrefours*, or, if this does not succeed, of the interscapular region or the lumbar curve as the case may require. In long-standing cases the suprarenal area should also be irradiated. Cure is hardly ever quite complete. In *eczema with lichen formation* the methods both of Gouin and of Pautrier have succeeded brilliantly. During the war of 1914-18 Delherm obtained remarkable results in *causalgia* by irradiating the various spinal sympathetic branches and the vascular *carrefours*. *Schulze's acroparaesthesia* has also been cured or much improved by the same method; and it will often mitigate *pain in amputation stumps*.

In *diabetes mellitus* indirect irradiation brings about two interesting effects. Desplats of Lille reported that it reduced the glycosuria; and in some cases irradiation is followed by a sudden rise in excreted sugar followed by a gradual fall which lasts a long time. In severe diabetes with emaciation, on the other hand, irradiation, when it has any effect at all, makes matters worse. Irradiation of the pituitary gland will often render insulin-resistant patients sensitive. Obviously it acts on the sugar-regulating function of the anterior lobe, but in order to be effective the hormone of this lobe must have adrenaline associated with it.

In *menstrual troubles* not due to any lesion or anatomical abnormality, irradiation of the *carrefours* gives interesting results. The disorder of ovarian function responsible for these troubles often coincides with facial acne, pruritus, or eczema of the genital region. Desplats, irradiating the suprarenal area instead of the lumbar curve, obtained good results alike in this class of disorder and in those associated with the physiological or surgical *menopause*. Usually a single treatment is sufficient; if it is not, a second and sometimes a third are given, at intervals of eight days.

Asthma has been treated by irradiating various portals of entry, including the thorax, the thorax and spleen, the pituitary, the pancreatic region, and the bulb. The exponents of these different techniques adduce their successes to confirm a variety of aetiological theories; the benefit is probably due to a non-specific protein shock.

In *Graves's disease* associated with sympatheticotonia, an inverted oculo-cardiac reflex, and a basal metabolism only slightly above normal or even a little below it, neither irradiation of the thyroid nor surgery gives any relief; the only effective treatment is irradiation of the suprarenal area.

Mechanism of Action

As the very small dosage produces no anatomical change it must modify function. The glandular secretions have been shown to be increased or reduced by it—a somewhat disturbing observation, for histologists (except for the doubtful results of R. Isaacs) have never yet been able to demonstrate that *x* rays stimulate cellular metabolism. On the other hand, radiations are known to modify, *in vivo* and *in vitro*, the fluid media of the body. Certain organic compounds—e.g., cholesterin, the fats, and amidin—are split up by hydrolysis; and the viscosity of the colloids is increased, according to dosage, up to the point of gelation. Richard Seyderhelm, by injecting previously withdrawn blood, could prevent or cure the anaemia

induced in an animal by the injection of saponin. It seems permissible to assume that these chemical changes, and perhaps also others as yet unknown, affect the glandular system without producing any appreciable anatomical alteration. They naturally vary according to the nature and degree of the disorder.

Through all the portals of entry employed the rays have access to the sympathetic nervous system. Radiotherapy therefore can modify the function of the sympathetic, and also of its perivascular plexuses, in various ways according to the dosage and the degree of excitability of the nerves. Gouin and Bienvenue produced by irradiation of the sympathetic the same reactions in the blood and the same clinical and therapeutic phenomena as Leriche produced by surgery. Moreover, besides the endocrine glands, which secrete their products into the blood, P. Masson has demonstrated the existence of endocrine tissues which secrete directly into the nerves. These two actions, humoral and nervous, proceed together. For instance, adrenaline acts by exciting the sympathetic nerves. Comparative anatomy and embryology show the close association of chromaffin with the sympathetic, and experimental physiology shows the close interaction of certain hormonal influences with corresponding neural factors—"sympathetico-glandular synergy." It is therefore easily conceivable that radiotherapy applied to the sympathetic and glandular systems may excite modifications which produce the beneficial effects that have been noted. As yet no one knows why or how it restores a disturbed balance by acting on that phase of the reciprocal vegetative function which happens to be impaired. This and many other difficult questions remain to be answered, and the answers will be as interesting as they are valuable.

TREATMENT OF PHOSPHORUS BURNS

BY

A. THELWALL JONES, M.D.

A notable increase in the incidence of phosphorus burns must be expected under war conditions, and the article by E. W. Godding and H. E. F. Notton in the *Journal* of April 4 (p. 433) is therefore timely and useful. There are several points in this article which deserve further comment. It should be stated that the "official treatment" which they critically examine has been based on the practice gradually established through long clinical experience within the chemical industry and is the result of careful observation over many cases. These authors are under a misapprehension on one minor issue, as they assume that the copper sulphate treatment is designed chemically and completely to destroy the phosphorus particles left in the affected area after the preliminary washing. This is not the primary object, which is rather to destroy minute particles and to make obvious, by blackening, the larger pieces so that they can be removed mechanically. There is no present clinical evidence that the concentrations, both of alkali and of copper sulphate, suggested "officially" are inadequate, and indeed the extant case histories indicate that they are well chosen. Godding and Notton have done well, however, to stress that the alkaline treatment must be thorough, and the importance of this feature is borne out by my practical experience. A novel problem associated with present conditions is the satisfactory treatment of phosphorus burns under field or Service conditions. Here the practice found good enough in industry would often be difficult to apply with the requisite speed, and a satisfactory field dressing would be a valuable contribution to the casualty services. The powders suggested by Godding and Notton may prove of value in this connexion, and should certainly be given a thorough trial on human cases; it may be possible to get the requisite experience industrially. One further caution is necessary: Godding and Notton experimented with material from S.I.P. (self-igniting phosphorus) grenades, and this is not strictly comparable to the phosphorus as encountered in industry, though the effects may reasonably be assumed to be similar. The following notes on the treatment of phosphorus burns may be of interest:

Characteristics of the Burns

Burns caused by phosphorus have long been recognized as particularly severe and troublesome lesions. They have these characteristics: (*a*) the initial pain is severe; (*b*) a greyish area is produced almost immediately at the site of the lesion, and blistering is rare; (*c*) sepsis is particularly apt to ensue; (*d*) healing is prolonged, and the resulting scar is often thin and atrophic. During the past ten years I have had the opportunity of studying burns arising from a variety of chemical irritants and corrosives. Generally, the severity of burns is proportionate to the chemical nature of the causative agent, and may be placed in the following order: (1) hydrofluoric acid, (2) phosphorus, (3) sodium sulphide, (4) caustic soda, (5) sulphuric and other acids.

Method of Treatment

The essential factor in the treatment of all chemical burns is the immediate flooding of the area affected with water or sodium bicarbonate solution. It is necessary to organize an adequate first-aid service for this purpose. Buckets of water, running water, eye-wash bottles, and, in special cases, baths must be instantly available. Experience has indicated that immediate flooding with water and *prolonged soaking* in *warm* sodium bicarbonate solution is the essential feature in treatment.

Altogether 65 cases of burns caused by phosphorus have been observed, the records of which are set out in the accompanying Tables. (In every case the time taken to heal is recorded as a period which elapsed before the employee was able to return to normal work without *any* dressings.) Several methods

Cases treated with Sodium Bicarbonate, Copper Sulphate, Acriflavine Emulsion (1/1,000), *and Boroseptic Ointment*

Age	Date of Burn	No. of Burns	Area Affected	Degree	Total Size (sq. in.)	Days Absent from Work	Days taken to Heal	Comments
22	24/1/39	4	Fingers	3	2½	Nil	30	
34	14/3/39	1	R. fore-arm	3	8	,,	17	
34	14/5/39	1	Eyelids, face	2, 3	9	Hosp. 28	17	
29	29/6/39	1	Heel	3	6	30	22	
46	8/6/39	1	Ankle	3	4	16	10	
27	9/7/39	4	Wrist, fingers	2	2	Nil	30	
36	14/7/39	4	Neck, chest	2, 3	5¾	,,	49	Skin eruption with acriflavine
36	14/10/39	1	Forearm	3	1½	Hosp. 81	79	Sensitive thin scar. Skin eruption with acriflavine
42	26/10/39	1	Finger	3	1½	Nil	19	
41	12/11/39	1	,,	3	¾	,,	17	
42	16/11/39	1	Palm	3	¾	,,	4	
30	17/11/39	2	Fingers	3	¾	,,	18	
25	13/12/39	1	Arm	3	6	,,	25	
34	18/12/39	4	Hand, fingers	2, 3	1½	,,	17	
—	10/1/40	2	Fingers	2	½	,	12	
46	6/2/40	4	,,	3	6	,,	4	
32	8/2/40	1	Hand	2	1	,,	4	
37	24/2/40	1	Forehead	2	¾	,,	9	
28	7/3/40	1	Finger	3	¼	,,	11	
36	14/3/40	1	Hand	2	¾	,,	7	
38	15/3/40	1	Forearm	3	1½	,,	23	
46	28/3/40	1	Finger	3	¼	,,	12	
36	2/4/40	1	,,	3	1	,,	18	
35	10/4/40	3	Fingers	3	1½	16	24	
34	25/4/40	1	Forehead	3	4½	Nil	60	
68	13/5/40	2	Forearm	3	1½	,,	24	
47	15/5/40	1	Wrist	3	1	,,	16	
42	23/5/40	2	Fingers	3	1	,,	8	
29	2/6/40	1	Hand	3	4	,,	35	
29	2/7/40	1	Finger	3	¼	,,	20	
36	4/8/40	3	Arm, forearm	3	32¾	,,	32	Skin eruption with acriflavine
45	21/11/40	1	Palm	2, 3	¾	,,	18	
38	25/11/40	1	Thumb	3	1½	,,	27	
24	25/11/40	2	Wrist, hand	3	1½	,,	39	Given light work
25	28/11/40	3	Wrist, fingers	2, 3	3	,,	33	,, ,,
37	29/11/40	1	Thumb	2	¾	,,	8	
—	4/12/40	3	Fingers	3	2	,,	24	

Cases treated with Sodium Bicarbonate, Copper Sulphate, Picric Acid, and Boric Ointment

Age	Date of Burn	No. of Burns	Area Affected	Degree	Total Size (sq. in.)	Days Absent from Work	Days taken to Heal	Comments
35	10/11/33	1	Foot	2	1	Nil	8	
36	13/11/33	1	Eyelid	3	¼	,,	17	
37	14/11/33	1	Thumb	2	¾	,,	7	
47	15/11/33	1	Forearm	3	¾	,,	12	Sepsis
35	20/11/33	2	Fingers	3	1	,,	13	
42	25/11/33	1	Finger	3	1½	,,	12	
34	28/11/33	3	Hand, fingers	2	1½	,,	5	
33	30/11/33	2	Fingers	2	½	,,	7	
37	1/12/33	1	Hand	3	2	,,	21	
35	4/12/33	1	Wrist	3	¾	,,	10	
—	25/8/35	2	Fingers	3	1½	,,	18	
—	28/8/35	3	,,	3	1½	,,	15	
34	2/9/37	1	Hand	3	1½	,,	42	

*Cases treated with Sodium Bicarbonate, Copper Sulphate, and Burnogel**

Age	Date of Burn	No. of Burns	Area Affected	Degree	Total Size (sq. in.)	Days Absent from Work	Days taken to Heal	Comments
28	20/2/37	2	Hand, humb	3	3	Nil	19	
41	1/3/37	1	Hand	3	5	27	31	Sepsis—ichthyol substituted
45	28/5/37	1	Forearm	3	1	Nil	19	
43	3/9/37	4	Arm	3	2¾	,,	29	Pain ichthyol substituted
38	12/11/37	1	Knee	3	30	12	28	Ichthyol used when healing
36	17/11/37	1	Calf, leg	3	5	Nil	43	,, ,,
29	12/2/38	1	Thumb	3	½	,,	15	
36	5/5/38	1	L.f. heel	3	2½	32	35	Thin scar. Sepsis—ichthyol substituted
40	17/5/38	6	Fingers, thumb, cheek	3	6	Hosp.	43	Thin scar. Off work 60 days
35	17/10/38	1	Finger	3	1	Nil	18	
34	15/11/38	1	Hand	3	12	51	59	Pain after 2 days — ichthyol substituted
38	10/6/39	1	,,	2	1½	Nil	10	
39	20/8/39	1	Ankle	3	6	36	48	Ichthyol required

* Copper guaiacol sulphonate, 0·2% ; acriflavine, 0·05% ; benzamine borate, 0·1% ; perfume and jelly base, ad 100%.

Cases treated with Sodium Bicarbonate, Copper Sulphate, and Tannic Acid

Age	Date of Burn	No. of Burns	Area Affected	Degree	Total Size (sq. in.)	Days Absent from Work	Days taken to Heal	Comments
40	18/1/37	2	Two fingers	3	1½	Nil	32	Painful
21	3/2/37	1	Hand	2	½	24	5	,,

of treatment have been tried, and as a result of the experience gained the following procedure is advised:

(1) Immediately flood the affected area with water.

(2) Thoroughly flood and wash with warm sodium bicarbonate solution (roughly two tablespoonfuls to a pint of water). Pick off with forceps any obvious particles of phosphorus disclosed by examination in the dark.

(3) Swab the affected area with 1% solution of copper sulphate and make a further exploration for phosphorus particles so revealed. Soak the affected area (immerse if possible) in warm sodium bicarbonate solution for a prolonged period. The duration of this soaking depends upon the size and depth of the burn—i.e., small burns 1/2 hour, large burns 1 to 2 hours.

(4) Dress daily with acriflavine emulsion 1/1000. Burns near the eyes are best treated by a mask of lint soaked in sodium bicarbonate solution renewed four-hourly.

(5) Immediately healing begins (7 to 10 days) boroseptic ointment (P. D. & Co.) provides a very satisfactory dressing, and its use can be continued until the scar produced is sound.

Tannic acid and other coagulants do not give satisfactory results, as is also the case in the treatment of all chemical burns. Acriflavine emulsion has the disadvantage that in some individuals local and generalized skin eruptions may be produced. A daily inspection will detect such lesions at an early stage, when boroseptic ointment should be substituted.

As a result of such treatment results are obtained which compare favourably with a similar series of burns caused by caustic soda and sulphuric acid. Healing is slower and scars are thinner in burns caused by phosphorus.

RELATION OF PYOGENIC SKIN INFECTIONS TO THE SKIN-CARRIER RATE

BY

N. H. MARTIN, B.M., M.R.C.P., F.I.C.

Major, R.A.M.C.

Bacteriological investigations have demonstrated that a fraction of the presumed healthy population carry potentially pathogenic staphylococci on their wrists. The actual proportion of carriers varies from 5% found by Nimmo-Smith (1941), examining R.A.M.C. personnel, to 19.5% found by Gillespie, Devenish, and Cowan (1939), examining students. Devenish and Miles (1939) appeared to show that a previous history of pyogenic skin infection was not given by a significantly higher percentage of skin carriers than normal.

The Present Investigation

The object of the investigation was to discover whether or not the carrier rate varies with the part of the body sampled, and if there was a significantly higher carrier rate in people suffering from pyogenic skin infections as judged by multiple swabbing. The series investigated consists of group A, 140 patients suffering from pyogenic infections of the face or neck, and group B, 100 individuals having no demonstrable pyogenic lesions. An effort was made at first to ascertain whether or not individuals of group B had at any time suffered from pyogenic skin infections. This was abandoned because it was clear that they were not equally reliable as witnesses. So far as the inquiry went there seemed to be no evidence of a significantly higher carrier rate among those giving a previous history of skin infection.

Technique.—Three swabs were taken from each person. The first swab was from the upper lip in group B and from the upper lip where possible in group A, but in every instance at least one inch from the nearest demonstrable lesion. The second swab was taken from the right wrist in right-handed people and from the left wrist in left-handed people. The third swab was taken from the chest in the midline opposite the second rib. At each site an area of 2 sq. cm. was sampled with a broth-impregnated swab which was stroked over that area 30 times in 30 seconds. The swabs were immediately plated out on blood agar and on gentian-violet agar at 37° C. for 24 hours. The plates were then examined, and selected colonies of staphylococci were subcultured and tested for their ability to form coagulase. At the same time their ability to form pigment was noted. The coagulase test was chosen as a basis for assessing pathogenicity ; and it was observed that 5 out of 151 strains isolated from group A failed to produce any pigment though they were coagulase-positive. McFarlan (1938) showed that a number of non-pathogenic strains of the staphylococcus would ferment mannitol, and this test was not carried out. The plates containing gentian violet were used for the isolation of streptococci.

Discussion

The results are shown in tabular form. There is in the series under review a significant increase in the "complete carriers" of potentially pathogenic staphylococci in group A. Though this may be, and probably is, a transient phenomenon, the carrier area appears to be extensive. A comparison of the carrier rate for the face, wrist, and chest in each group shows that in group B it varies, being highest, as might be expected, on the face. In group A the variation though present is not so marked, the difference between face-carrier rate and chest-carrier rate being 13.2%, compared with 24% in group B.

There appears to be a significant rise in the incidence of β-haemolytic streptococci on the face in group A, but not elsewhere. Here again recovery of the organism varies with the area sampled. The figures seem to demonstrate that the presence of a localized skin lesion produces a wide-spread increase in pathogens on the normal skin. If this be so it must materially alter our conception of the results to be expected from localized forms of treatment for pyogenic skin infections.

Table of Skin Carriers

	Carrying Coag. + Staphs.		Carrying β-haemolytic Streps.	
	Group A	Group B	Group A	Group B
Face only ..	13·1%	15·0%	6·5%	3·0%
Wrist only ..	8·0%	3·0%	1·4%	1·0%
Chest only ..	3·6%	1·0%	Nil	Nil
Face and chest ..	5·1%	4·0%	Nil	Nil
Face and wrist ..	8·0%	12·0%	0·7%	1·0%
Chest and wrist ..	4·3%	2·0%	Nil	Nil
Face, wrist, and chest	30·7%	7·0%	1·4%	1·0%
Total face ..	56·9%	38·0%	8·6%	5·0%
Total wrist ..	51·0%	24·0%	3·5%	3·0%
Total chest ..	43·7%	14·0%	1·4%	1·0%

My thanks are due to Col. R. Rees for permission to publish this paper.

REFERENCES

Devenish, E. A., and Miles, A. A. (1939). *Lancet*, **1**, 1088.
Gillespie, E. H., Devenish, E. A., and Cowan, S. T. (1939). Ibid., **2**, 870.
McFarlan, A. M. (1938). *British Medical Journal*, **2**, 939.
Nimmo-Smith, A. (1941). *J. R.A.M.C.*, **76**, 341.

Medical Memoranda

A New Diagnostic Sign in Sciatica

Sciatica in form of neuritis or neuralgia presents a problem of grave importance on account of its frequency and chronicity. The loss of working days due to the condition is considerable.

Very often sciatica reveals itself only as a pain along the course of the sciatic nerve, without objective symptoms, such as alterations in knee- or Achilles jerks, trophic changes, etc. The surest indication of the existence and intensity of sciatica is the sign of Lasègue. This consists in an increase of pain when an attempt is made to extend the leg with the thigh flexed. The intensity may be measured by the angle at which the pain arises. Putti terms this L+++ if the pain is felt before the leg reaches 45 degrees with the axis of the thigh, L++ at 45 to 90 degrees, and L+ at 90 degrees and complete extension. The Lasègue sign is the result of stretching of the affected nerve. Several other signs depend on the same cause—i.e., the sign of Neri (flexion of the head, producing sciatic pain), and that of Goldthwait (flexing the thigh to a point of tolerance with the knee flexed, and then forced extension of the knee). To these we must add the contralateral sign of Lasègue, described by Montard-Martin and Parturier, and by Bechterew.

Lasègue's sign is very reliable, but in my opinion is too often positive. There are two reasons for this. First, as Bragard has shown, often purely muscular changes of the thigh in form of thickenings (*Muskelhaerten*) give a positive Lasègue sign (*Pseudolasègue*) in the absence of nerve involvement; secondly, certain individuals, for purposes of malingering, try to deceive the physician by false statements—many of them being acquainted with the Lasègue sign.

In many years' experience I have always controlled the Lasègue sign by the sign of Bragard, which I regard as of great diagnostic value. It consists in considerable increase of pain when a sudden dorsal flexion of the ankle is performed at the point where pain begins. Personally I employ the classical sign of Bragard plus this modification: at the point where pain disappears on lowering the leg, a sudden dorsiflexion of the ankle produces pain in the formerly painless leg.

My new phenomenon is as follows. The leg, flexed at the hip-joint and extended at the knee, with the foot in dorsiflexion, is slowly raised. In the case of sciatica a point is reached at which pain arises (first stage); a sudden extension of the foot now causes the pain to disappear instantly (second stage). This is a reversed Bragard sign.

I hope the new sign here described will be of help to physicians not only for the diagnosis of sciatica but also for revealing cases of malingering.

A. J. MESTER, M.D.

BIBLIOGRAPHY

Bragard, K. (1928). *Münch. med. Wschr.*, **75**, 387.
Ellis, J. D. (1940). *The Injured Back and i:s Treatment*, Springfield, Ill.
Putti, V. (1936). *Lomboartrite e Sciatica Vertebrale*, Bologna.

Reviews

MEDICINE AND SOCIOLOGY

Society and Medical Progress. By Bernhard J Stern. (Pp. 264. $3.00 or 18s. 6d.) Princeton: Princeton University Press; London: Oxford University Press. 1942.

Mr. Bernhard Stern, although a social scientist working outside the medical profession, proves in his *Society and Medical Progress* that he has paid close attention to the interactions between medicine and sociology. His first chapter on the slow emancipation of medicine from magic and its congeners does, however, give rather too depressing a view of that delay. Thus an epoch which produced Heberden's *Commentaries* can hardly have lacked clinical observation and scientific reasoning so much as is here suggested: on the other hand the reasons for the decline of medicine between Galen and the Renaissance are clearly stated in the quotation from Vesalius. As the author points out, medicine cannot develop and never has developed in isolation, for its progress is circumscribed by that of ancillary sciences and by the environment of the age. Urbanization has introduced new problems, as has the increasing proportion of elderly people. "Grave challenges are inherent in the new situation which medical science has helped to produce by its increasing efficacy. Medicine has not been able to provide economic security for the aged whose lives it has prolonged; that is not its province; but as he goes on to say, it has alleviated the mental suffering of populations in other ways than by the control of epidemics and the lowering of death and disability rates. One striking example is the new knowledge of nutrition, which is enabling this country to stand up to the strain of war to an unexpected degree. Yet as a rule the humanitarianism of the medical man has been mainly directed towards individuals; he has often ignored the larger social implications of his work. That, however, is tending to alter in the face of the present dangers to civilization.

The book closes with an interesting analysis of the factors that offer resistance to medical change; some internal, others external to the profession. Thus medical education has not really made up its mind whether it wishes to develop specialists or students whose training will enable them to develop competence to evaluate and use new methods as they arise. Obviously, we might urge that both are needed. Of ancient internal causes of delayed progress none was stronger than the contempt for the use of the hands, as Allbutt so vigorously insisted. More permanent causes are the reliance on authority and the dislike, by no means confined to medicine, of new ideas which challenge that authority. The external causes are antiscientific, romantic approaches to life and thought, which are not isolated phenomena but reflect the temper of intellectual life prevailing at the time. This in the last analysis he regards as related to the social and economic developments of the day.

NEURO-ANATOMY

Neuroanatomy. By Fred A. Mettler, M.D., Ph.D. (Pp. 476; illustrated. 37s. 6d.) London: Henry Kimpton. 1942.

This is a superbly illustrated volume, which Prof. Mettler states "has been written to meet the needs of the medical student beginning instruction in neuro-anatomy and to prepare him for the demands which will later be laid upon him in his clinical training." The text is divided into two parts: (1) dealing with the topography and morphology of the central nervous system; (2) the microscopic anatomy of the nervous system. Although the author declares that no pretence of originality is made for any of the material presented, there is much which will be new to readers who have not made a special study of particular sections of the subject, such as that on the diencephalon and the structures related to it. This section is chiefly based upon data from Papez and Aronson, and is illustrated by schemata redrawn from these authors' work on the diencephalon of *Macaca mulatta.*

An enormous amount of material appears to have been used in the production of *Neuroanatomy*, as is indicated by the literature cited in a very full list of selected references. The outstanding feature of this work is, however, the production and illustration of a large number of specially planned dissections

and of serial microscopical sections prepared by the Weigert and Nissl methods. Illustrations of the latter have been placed for comparison side by side, and all are fully and clearly labelled. From the standpoint of the medical student beginning the study of neuro-anatomy certain comments seem necessary. (1) There appears to be some danger of confusion arising from the great wealth of minutely described topographical details, and one would like to find further guidance in the way of introductory notes indicating the more important facts and principles, a knowledge of which is essential for medical practice. (2) A short introductory account would be welcome of particular organs or systems, such as the hypophysis or cerebellum, indicating their main functions, with reference to, and in explanation of, their anatomical relations. (3) Some brief allusions to the developmental history and comparative anatomy of particular organs and parts would enhance the general interest of the subject and give a scientific explanation of certain anatomical facts and peculiarities of the mammalian brain, such as the evolution of the corpus callosum, the nature of the septum pellucidum and its cavity, or the course of the spinal accessory nerves.

Neuroanatomy may be regarded as an authoritative work, which is beautifully illustrated and includes, in one volume, a clear description of the subject as a whole, and also embodies an account of important recent contributions to the anatomy of particular regions of the central nervous system that will be of great value to nerve specialists.

CARE OF THE PREMATURE INFANT

The Premature Infant: Its Medical and Nursing Care. By Julius H. Hess, M.D., and Evelyn C. Lundeen, R.N. (Pp. 309; illustrated. 21s.) Philadelphia, Montreal, London: J. B. Lippincott. 1942.

A book on *The Premature Infant* by Prof. Julius H. Hess is sure of a welcome, and in this new volume, with its subtitle "Its Medical and Nursing Care," he has been assisted by Miss Evelyn C. Lundeen, who is the supervisor of the special department of the Sarah Morris Hospital, Chicago, where so much valuable work on the premature baby has been done. It is over 20 years since Dr. Hess first published his well-known work on this subject, and the present volume, containing as it does a certain amount of material from that book, may be regarded as a sort of sequel in which the practical implications of his earlier teaching have been fully worked out. Thus details are given of all the procedures recommended, and chapters on incubators, on home care, and on feeding, for example, are full of well-tried and useful practicalities. Something might have been included about intracranial disturbances other than haemorrhage, nor is there any mention of the use of thyroid gland or oestrogen as a possible metabolic stimulant in the early days of life. These are, however, minor matters in a large subject, and all having the care of premature infants will find much of value to study in this book. Properly mastered, the methods advocated should go far to reduce the neonatal mortality as effectively in Great Britain as it has been reduced in Chicago.

SCIENCE OF PERSONALITY

Foundations for a Science of Personality. By Andras Angyal, M.D., Ph.D. (Pp. 398. $2.25 or 13s. 6d.) New York: The Commonwealth Fund; London: Oxford University Press. 1941.

This dissertation on personality postulates that the subject must be studied as a whole and not simply as an aggregation of parts. This does away with the antithesis of body and mind and formulates them as different aspects of study within the whole. Personality is essentially dynamic and not static, and the chief trends within it which react and interact are the tendency to greater self-determination (autonomy) and that towards conformity with the dictates of superindividual wholes, such as society and culture (homonomy). The first tends to impose the intrinsic determination of the individual upon a widening realm of events (aggression); the second tends to fit the individual into schemes of culture, religion, etc. (submission). Obviously in man the specific channels for expression of personality are extremely diverse and more or less defy classification.

Dr. Angyal discusses the integration of the personality and disturbances of this and attempts to define the systems which make up the personality. A complete view of the personality, however, can only be obtained if the time dimension (the biography) is also taken into account. In handling segmental data (physiology, psychology, anthropology, etc.) each of these should be related to the whole and not to each other (e.g., psychology to physiology). The subject is dealt with from the philosophic point of view and so may not be very easy reading for many medical men, but it is important in the understanding of the main object of medical study—the human being.

Notes on Books

Ornithologists of the United States Army Medical Corps, by Colonel EDGAR ERSKINE HUME of the U.S. Army Medical Corps is published at Baltimore by the Johns Hopkins Press, price $5. It is not easy to understand the purpose of this book, which can have little appeal to British medical readers and bird lovers. It is a record of the lives of thirty-six U.S. Army surgeons, each of whom is the subject of a chapter containing references to ornithological contributions. Most of the biographies deal with the stirring times when the U.S. Army was on active service winning the great west from hostile Indians, and are interesting in that respect. The growth of the American Army Medical Department from a handful of officers in the 'fifties to the huge organization it now is can be traced throughout these lives. There is, however, not much information of value to those of us who are keen on birds, and, indeed, there is little that requires to be said, for the immortal pioneer work of Audubon, Wilson, and Nuttall has placed American ornithology on a high plane and has been followed by a host of scientists who have done work of distinction in recording accurate observations on birds. The volume is well illustrated with photographs of the doctors and the forts where they were stationed. Most of the birds described are not indigenous to this country. Colonel Hume, who is a military medical historian, says in his introduction that he "cannot himself claim knowledge of ornithology, but only admiration from a respectful distance." American medical officers will nevertheless find this book about their predecessors very readable.

Tropical and Sub-Tropical Diseases, by Dr. C. H. BARBER, is published as one of the Oxford War Manuals at 5s. by the Oxford University Press. The stated aim of this pocket compendium is to serve the needs of medical men in the Forces over-seas. Its scope is wide and 60 diseases and morbid conditions are given in the table of contents. The space allotted to each varies from 20 pages (malaria) to 8½ lines (myiasis). There are some strange omissions. Nothing is said of *Cordylobia* infestation, a real pest in the last war and already troublesome in this, or of the dosage and course of pentavalent compounds of antimony in kala-azar, yet room is found for accounts of goundon and ainhum, neither of which is likely to give rise to any urgent problem. Possibly due to hasty compilation, there are some muddled and confusing statements. Thus on p. 25 the oddly named species "*Culex Fatig.*" and "*Culex P.*" are shown as genera, and on p. 134 it is stated that the "diurnal periodicity" of microfilariae coincides with that of "the chief insect vector . . . namely, the *Stegomyia mosquito*, or Culex fatigans (*Aëdes variegatus*). In the Pacific Islands, however, this periodicity does not obtain." This is a hard saying. The lack of system in writing zoological names, as in the foregoing extracts, is general throughout the book; sometimes the author follows the directions of the International Rules, sometimes not, and the resulting patchwork is most unpleasing to the trained eye. In view of the expressed object of the compendium, medical officers of the Army would be well advised to stick to the official "Memoranda on Medical Diseases," etc., until something better than this Oxford War Manual comes along.

The public schools of this country are going through difficult times, and the relative advantages and disadvantages of day schools and boarding schools are under keen discussion in the Press. What will come of it all remains to be seen, but meanwhile the 53rd annual issue of the *Public and Preparatory Schools Yearbook* has been published by H. F. W. Deane and Sons at 10s. 6d., and fulfils its useful task of supplying information to the parents of to-day. No fewer than 30 public schools and 158 preparatory schools for boys have had to move their quarters owing to the war. Temporary addresses, with cross-references to the normal home of each school, are given and brief details of altered arrangements. The schools listed in this yearbook are those represented at the Headmasters' Conference or belonging to the Association of Preparatory Schools. It also contains particulars about the universities and some guidance on careers.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY AUGUST 29 1942

MECHANICS OF THE CIRCULATION

Those who begin to study the circulation often find themselves in difficulties about its mechanics, and, to surmount these, many attempts have been made to study it by means of models. Most teaching schools have some sort of a model illustrating the factors concerned in the maintenance of the arterial blood pressure—i.e., the output of the heart together with the peripheral resistance and elasticity of the vessels—but no one has yet produced a model that demonstrates satisfactorily all the changes possible in the living animal. The latest attempts are those of L. Bayliss,[1] and of Price, Sloan, and La Rochelle.[2] The latter, indeed, have from a study of their model gone so far as to say that the concept of a disparity between blood volume and vascular capacity does not bear analysis, and criticize on this account even the possibility that shock may be due to such disparity, forgetful, apparently, that a model can be made to prove anything. As a guide to model makers it is, then, not out of place to indicate what is required.

First, a pump is necessary which will not only vary its rate, stroke, and force, but will fill in the first third of diastole in virtue of the venous pressure, for without this it is not possible to illustrate properly the law of the heart and the full effects of rate on output. Without this facility the output per beat is reduced whenever the rate is increased, because the filling is reduced. Such a pump was not used by those referred to. But that is not to say, as pointed out by Starling, that the output of the heart per minute is necessarily a function of the rate, for if the venous pressure is low the heart may need all its diastole to fill. In some circumstances, such as after very severe haemorrhage, the filling may be so slow that slowing of the heart may actually cause a slight rise of arterial pressure. It is also very difficult to construct a pump which will automatically vary its force according to the amount of blood in the heart at the beginning of systole so that there is an increased output per beat in approximately the same systolic time as a smaller output. In these days a simple model is available in the form of a stirrup pump made to discharge into the pail, but it does not show the infinite variation of the circulation.

The effects of cardiac failure and reduced cardiac output are easily shown on a model or on an animal by increasing the pericardial pressure or by stimulating the peripheral end of the vagus. There is a rise of venous pressure, which in the model is accompanied by a fall of arterial pressure, but in the animal or man, in whom such failure is a common feature of cardiac disease, the arterial pressure does not fall until all the vasomotor compensation has been called into use. In man we see the engorged veins of chronic venous congestion standing out in a pallid skin. It is possible, too, that a high venous pressure may eventually interfere with the emptying of the coronary sinus and cardiac nutrition. Increased cardiac efficiency has the opposite effects both in the model and in the animal, but for reasons given later this is difficult to demonstrate unless the heart has first been rendered inefficient.

[1] *J. Physiol.*, 1940, **97**, 429.
[2] *Johns Hopk. Hosp. Bull.*, 1942, **70**, 26.

In the majority of models, simple or elaborate, the effects of simple changes in the peripheral resistance are also easy to show. A decrease results in a fall of arterial pressure accompanied by a simultaneous rise in venous pressure that is the same as in cardiac failure, but with the difference that all degrees cause the fall of arterial pressure and the rise of venous pressure coincides with it. A fall of resistance is brought about by a minute dose of acetylcholine, a rise by clamping the aorta. Most of the other procedures and drugs which affect the peripheral resistance complicate the issue by affecting the capacity of the circulation. This variable capacity of the circulation was unknown until it was demonstrated by Dale with Richards and Laidlaw,[3] [4] and Krogh[5] demonstrated that capillaries, normally closed, might open and soak up the blood like a sponge, greatly diminishing its return to the heart. But as the capillaries contribute to the peripheral resistance it is necessary to construct a model which will incorporate these features. An increased capacity is produced by histamine, by amyl nitrite, after asphyxia, and, normally, after severe exercise. There is not only a fall of arterial pressure but also a fall of venous pressure, which may, however, be preceded by a rise due to the fall of peripheral resistance if the capacity does not increase so rapidly as to mask it. As the return of blood to the heart is reduced vasomotor compensation ensues, and there is a rapid recovery of the peripheral resistance (due to arterial and arteriolar constriction); the arterial pressure recovers appreciably through the venous does not. The arterial constriction shows itself in a rise in the velocity of the pulse rate for a given internal pressure (McDowall).[6] This cannot easily be imitated by any model. A similar return of the arterial but not the venous pressure is also seen after slight haemorrhage. The significance of any given changes in the intact circulation can be interpreted only when they are compared with the results from the study of blood flow, limb volume, and perfusion resistance, and in this the paper of Dale and Richards[3] is a model worth studying. Wiggers has also made extensive studies of this problem from the shape of the pressure pulses obtained by means of the Frank's capsule.

The administration of amyl nitrite gives an interesting series of changes which may be analysed thus. First, accompanying the fall of arterial pressure is a large fall of venous pressure due to increased capacity, preceded, maybe, by a short-lived rise due to reduced peripheral resistance; but at the stage when the height of arterial pressure depends largely on the arterial compensations there is a rise of venous pressure only. When the increased capacity of the circulation is caused by a generalized loss of vasomotor control there is a fall of arterial and venous pressures, but the arterial compensation is absent. This state is produced experimentally by sections of the spinal cord in the neck which cuts off the sympathetic supply to the body, and is probably present in the ordinary faint and in the neurogenic variety of shock. Recently, McDowall[7] has pointed out that the fall of peripheral resistance may be a major factor in those cases of shock which fail to respond to the transfusion of blood or plasma. Moreover, in the intact animal the pulmonary circulation may affect the greater circulation. Thus intense pulmonary constriction may cause a delayed rise of venous pressure from failure of the right heart, as with histamine, in which case it masks the early effects of increased capacity. Similarly, sudden rapid constriction of pulmonary vessels may cause falls in arterial pressure. The reverse may also occur. Respiration

[3] *J. Physiol.*, 1918, **52**, 110.
[4] Ibid., 355.
[5] *Anat. and Physiol. of Capillaries*, 1929, 2nd ed., New Haven: Yale Univ. Press.
[6] *Quart. J. exp. Physiol.*, 1925, **15**, 181.
[7] *British Medical Journal*, 1941, **2**, 75.

also affects the resistance and capacity of the pulmonary vessels. The resistance is increased and the lung capacity decreased by expiration, while the reverse occurs in inspiration. Their effects on the arterial and venous pressures do not coincide exactly with the pulmonary change, but are slightly delayed. It has to be remembered, too, that usually changes in the heart rate are accompanied by changes in the vessels. Thus in a faint vessels are dilated (except the skin) while the heart is slowed; the reverse occurs in the excitement and early exercise. Drugs, also, often produce effects on both heart and vessels—e.g., adrenaline and digitalis. Further, there is a vast number of venous and arterial reflexes by which rises and falls in pressure affect both the heart and vessels. Models cannot imitate these, for all are not completely understood. Finally, we must consider other unknown factors in the circulation, such as the psychological. At the moment, one of the most puzzling problems is that the heart rate so commonly falls in donors when blood is given, when all past experiences, both experimental and clinical, would lead us to expect that it would rise. Thus we see how inadequate models of the circulation are liable to be; they can be of value primarily to illustrate a fact already derived from a study of the experimental animal.

THE SCIENTIFIC LIFE

It is possible to hold two wholly different views of the qualities and circumstances favourable to success in scientific research. More than 300 years ago Francis Bacon formulated a grand, or grandiose, scheme which was to reduce scientific discovery to laborious but unimaginative team-work. Bacon's plan received the support of a few philosophers who were not themselves scientific workers, but, with the doubtful exception of Robert Boyle, none of the great researchers of his age had much use for Bacon's plan, and Harvey spoke of it with gentle sarcasm. That continued to be the attitude of most researchers down to our own time. They did not hold that discovery was a mere matter of luck, but they did think, with Pasteur, that chance helped people whose minds were ready to be helped and that fine original work in science depended on the freedom of the human spirit, that the utilitarian aspect of any proposed investigation was about the last which should be given weight in choosing one's subject. This attitude was never approved by practical men, and recently some writers who have to their credit considerable achievements in pure scientific research, and therefore cannot be reproached with ignorance of the way in which discoveries are made, have explicitly or implicitly condemned it. One of them reviewed Prof. G. H. Hardy's *A Mathematician's Apology* with almost theological acrimony. This was not surprising, because Prof. Hardy had explicitly maintained that the useful parts of mathematics were rather dull and the "real" mathematics of "real" mathematicians almost wholly useless, and actually said that if a mathematician or a chemist or even a physiologist "were to tell me that the driving force in his work had been the desire to benefit humanity, then I should not believe him (nor should I think the better of him if I did)."

The neo-Baconians have naturally a very different plan from that of Bacon, but are equally insistent upon fruits and equally scornful of what seem to them useless or unprofitable researches. Dr. John R. Baker in *The Scientific Life*[1] may not enrage the neo-Baconians quite so much as Prof. Hardy—he is not sure that mathematics and logic belong to science—but he will annoy them a good deal. He is satisfied that the statements "Science is a product of human demands" and "Science has evolved from crafts and industry" are simply untrue, that scientific research can no more be planned or organized than the writing of symphonies or poems, and that amateurs—*real* amateurs of science—are the salt of the earth. A *via media* is possible, indeed suggested by Dr. Baker. It is this. The neo-Baconians are not really talking about science at all in the sense that Harvey or Newton would have given to the word, but technology, and technology can be planned and organized. The neo-Baconians have no difficulty in showing that technology, or applied science, has not been well planned in this country; but Dr. Baker's contention is that pure science—namely, scientific work done because the worker either loved his work or was driven to it by a daemon—cannot be organized or planned at all, and that without such pure science technology must eventually perish. He evidently thinks that a remark made by the Soviet Ambassador to the British Association on September 27, 1941—"We in the Soviet Union never believed in pure science"—was not wise but foolish. Probably the neo-Baconians might retort (1) that nothing they can do will stop those with a daemonic urge to pure research; (2) that there is a sufficient capital of pure scientific knowledge still unapplied to occupy a great many more able second-rate people in technology than are at present employed. But totalitarianism has made great strides in this generation. One might add to Dr. Baker's numerous examples of pure researchers Hermann von Helmholtz. He was educated for the medical profession at the expense of the State; almost his first and one of his fundamental contributions to science was a memoir on mathematical physics (a subject not included in his university training and studied by him in his spare time because it interested him). The Prussian Government of almost a century ago was influenced by the judgment of real scientists and allowed Helmholtz to pursue an academic career to the glory of pure science and, in due course, technology. One may doubt whether the military authorities of either Potsdam or Moscow in 1940 would have learned with satisfaction that an assistant surgeon to the regiment of Hussars spent a great deal of time perusing the works of mathematicians. That, however, brings us to a last point to be had in mind when we try to judge impartially the merits of the current controversy. We should not forget that the authors whom Dr. Baker flagellates were writing under the shadow or in the presence of war and disaster when technology is of more *immediate* importance than science (to the ordinary politicians, of course, science and technology are synonyms, but science is thought to be a more flattering term). Something must be allowed for emotional stress; zeal and arrogance are not easy to distinguish. Very few of those who survive the war will look back with complaisance to all they said or wrote during its currency.

[1] London: George Allen and Unwin, Ltd. (7s. 6d.)

THE WERNICKE SYNDROME AND VITAMIN B_1 DEFICIENCY

Wernicke in 1881 described a syndrome characterized by ophthalmoplegia, clouding of consciousness, and ataxia, resulting from acute haemorrhagic polioencephalitis superior. The lesions are confined to the periventricular grey matter of the brain, which shows small foci of degeneration and varicose deformities of the blood vessels. Recently the disease has been attributed to a conditioned deficiency of vitamin B_1, as the majority of the cases diagnosed were the result of alcoholism, and most of the symptoms cleared up promptly on treatment with aneurin.

The syndrome may be associated with a combination of several nutritional deficiencies. However, an interesting

confirmation of the view that aneurin deficiency is the principal causative factor of the disease comes from the observation of Wortis *et al.*[1] that patients with the Wernicke syndrome were unable to metabolize pyruvic acid normally. They showed a high fasting level of blood pyruvate, the figures being 1.44–3.63 mg. per 100 c.cm., as compared with 0.77–1.7 mg. per 100 c.cm. for normal subjects. When these patients were loaded with glucose an increase of their blood pyruvate occurred which lasted 4 to 5 hours, whereas healthy subjects under the same treatment showed only a transitory rise. After aneurin therapy the fasting level of blood pyruvate came down rapidly to normal, but the response to glucose loading became normal only after prolonged treatment. These experiments provide an interesting example of the use of a carbohydrate tolerance test for detecting vitamin B_1 deficiency, a possibility first suggested by Harris and co-workers at Cambridge.[2]

The Wernicke syndrome has a perfect analogy in the so-called Chastek paralysis of silver foxes which occurs as a result of feeding large quantities of raw fish. The disease is also characterized by anorexia, weakness, progressive ataxia, and spastic paraplegia. Post-mortem findings showed a striking similarity in the lesions of the central nervous system to those found in Wernicke's disease. That aneurin deficiency is the cause of Chastek's paralysis has been established beyond doubt by the work of Green and his co-workers[3] in America and Kringstad[4] and other workers[5] in Norway and Sweden. The American observers were able to produce the paralysis at will by feeding the silver foxes on a diet containing more than 10% of raw carp. They were also able to prevent the appearance of the disease by supplementing the diet with large quantities of aneurin, exceeding 10 mg. per animal per day. These results indicate that raw fish has the singular property of inactivating aneurin, either by destruction of the vitamin or by a process of adsorption which renders it unavailable to the animal. The first theory finds support in the work of Spitzer *et al.*,[6] who incubated raw carp entrails with aneurin and observed a destruction of 50 to 100% of the vitamin in 15 minutes. Thus it appears there is an anti-aneurin factor or factors in raw fish, destroyed by cooking. The existence of antivitamin factor is not limited to aneurin. At least two other examples of antivitamins have been found in connexion with biotin and vitamin E. The antivitamin of biotin is present in raw egg white, from which it has been isolated in the form of a protein which has received the name "avidin." Avidin acts by combining with biotin to form a stable complex which is not available to the organism. An antivitamin E factor has been found in cod-liver oil which is capable of destroying the vitamin when the two are fed together. Possibly still other antivitamin factors may be brought to light. A knowledge of these factors may be of great value in explaining many as yet obscure nutritional diseases.

HYPOGLYCAEMIA FROM PROTAMINE INSULIN

Recent correspondence and articles in this *Journal* have raised the question whether insulin hypoglycaemia in diabetics is becoming more frequent in both its minor remediable forms and its occasional fatal outcome, and whether the use of protamine-zinc-insulin is responsible. Ever since insulin has been used minor hypoglycaemia has been common, but recorded fatalities have been surprisingly rare, perhaps because seldom published, as they mostly depend on a discreditable and avoidable mistake on the part of either patient or doctor. But the increased incidence of grave hypoglycaemia since the introduction of delay-action protamine insulin is understandable and merits discussion.

The effect of a reduction of blood sugar falls on the central nervous system, and the mechanism and pathological results are becoming known. Glucose is the main, if not the only, fuel of the brain, and its metabolism and vital process stop without it. If the blood-sugar supply is cut off by insulin for a few hours (say 4 to 8) irreversible nerve-cell changes may occur which cannot be removed by the restoration of the blood sugar—fortunately an extremely rare event. Now soluble insulin, in use for 20 years, often causes hypoglycaemia in inappropriate doses by its quick and strong action, usually 4 to 6 hours after injection; but the effect is so short-lived that prolonged hypoglycaemia is unlikely, and spontaneous recovery tends to occur even without the administration of sugar, although it should be given promptly on diagnosis. In contrast, the prolonged action of protamine-zinc-insulin, although probably causing hypoglycaemia less frequently, keeps the blood sugar low when hypoglycaemia occurs, prevents spontaneous recovery, and is more likely to damage brain cells. In the vast majority of such incidents, however, glucose or sugar (1 oz.) produces complete recovery, but may have to be repeated to prevent relapse. Another danger with protamine-zinc-insulin is the temptation to give too much unless the limitations of its action are realized. It is weak in its action, and the active insulin liberated from the depot injection is often too little to prevent glycosuria after meals, although it clears the sugar during the night's starvation. If the dose is raised in an attempt to control the day's glycosuria, it has little effect except to cause hypoglycaemia at night, often just before breakfast. It is usually unwise to give more than 30 to 40 units of protamine insulin without careful investigation, and no more should be given than is sufficient to clear the urine secreted before breakfast. If on this dose heavy glycosuria occurs by day, added soluble insulin must be given and not more protamine insulin. The occurrence of hypoglycaemia at night has led some doctors to abandon the use of protamine insulin and to put their patients back on two doses of soluble insulin. When, however, the nature and action of protamine-zinc-insulin are appreciated and it is properly used, there seems no reason to withhold the benefit from most patients of only one injection a day instead of two.

Another, and preventable, cause of hypoglycaemia is the mistakes that arise from confusion over the different strengths of insulin solutions on the market—namely, 20, 40, 80 units per c.cm. Serious mistakes, too, are caused by the wide diversity of markings on syringes used for the injection of insulin: it is not uncommon to find some less intelligent diabetics taking twice or half the number of units intended by the doctor. Such errors could be minimized by the use of a standard insulin syringe throughout the country, and it is most important that the actual dose should be checked and demonstrated to each patient, not merely as so many units but in marks on their own syringe of the strength of insulin prescribed.

Another, and probably the main, cause of insulin hypoglycaemia is the fact that the best dose of any type of insulin, even on standard diets, is not a uniform but always an individual one, and a dose that may cause hypoglycaemia in one patient may be insufficient even to prevent diabetic coma in another more severe case. The establishment of the optimum dose in some cases requires a short period of close study which cannot be carried out at home, nor indeed in most general hospitals. In many

[1] *Arch. Neurol. Psychiat.*, Chicago, 1942, **47**, 215.
[2] *Biochem. J.*, 1939, **33**, 1346.
[3] *J. Nutrit.*, 1941, **21**, 243; 1942, **23**, 165.
[4] *Nutr. Abstr. Rev.*, 1941, **11**, 48.
[5] *Skand. Veter. Tidsk.*, 1938, **28**, 144.
[6] *Proc. Soc. exp. Biol. N.Y.* 1941 **48**, 376.

cases, therefore, imperfect treatment magnifies the difficulties of insulin treatment and obscures its benefit, so that chronic invalidism may persist where a full and useful life could be achieved. This state of affairs can hardly be rectified until sufficient centres for skilled diabetic treatment are available to provide in- and out-patient treatment for many, if not for most, diabetics.

HAEMOPHILIA IN ANIMALS

Haemophilia is a well-known disease among white races, and occasional cases of varying authenticity have been reported in men with skins of other colours. A. G. Hogan, M. E. Muhrer, and R. Bogart[1] suggest that a similar disease may occur in another species of mammal. A number of related animals in a herd of swine died from haemorrhage, either spontaneous or after minor trauma. The ordinary bleeding time, the platelet count, and the prothrombin time were all normal in the affected animals when compared with normal members of the same herd. The clotting time of venous blood was greatly prolonged, and the platelets, unlike those from normal animals, were slow to agglutinate and disintegrate *in vitro*. Thus the haematological findings are those of human haemophilia, but unfortunately no mention is made of the sex of the affected swine or whether any of them had haemarthroses. If this disease of pigs is in fact the haemophilia it seems to be, the fundamental lesion which has baffled so many investigators of human haemophilia ought soon to be uncovered.

A. L. Copley and J. L. Lalich[2] tried to produce a haemophilia-like condition experimentally by the injection of heparin into mice. The animals tended to suffer from spontaneous haemorrhages, and had a prolonged clotting time, a normal platelet count, and a bleeding time usually normal. As all the evidence goes to show that the prolonged clotting time in human haemophilia is not due to an anticoagulant in the blood, it is *a priori* unlikely that the heparinized mice suffered from anything really like haemophilia, and an examination of the experimental evidence, which is collected in a rather misleading table, does not support the authors' interpretation of the data. For instance, it is stated that the prothrombin content of heparinized blood, like that of haemophilic blood, is normal. Anyone who has ever tried to estimate the prothrombin in heparinized blood by the one-stage method knows how very differently from haemophilic blood heparinized blood behaves. The spontaneous haemorrhages do not resemble those found in human haemophilia either. The animals developed haematomata at the site of subcutaneous injection of heparin, but no attempt seems to have been made to control the *p*H of the heparin, which is usually strongly acid. A few mice which had been heavily heparinized licked the clot away from the site of the puncture which was made for determination of the bleeding time, and then suffered from prolonged bleeding which occasionally proved fatal. This is actually in contrast to what happens in haemophiliacs, in whom the clot is not firm enough to prevent spontaneous resumption of bleeding. The really striking point in these experiments is that the bleeding time was usually normal in the presence of a greatly prolonged clotting time. This is doubly significant, because the bleeding time was estimated by puncturing the tail vein, which would tend to give a long bleeding time, and the clotting time was estimated on capillary blood, which, because it is contaminated with tissue juice, gives a relatively short clotting time. The fact that the bleeding time was often less than one two-hundredth of the clotting time in these heparinized mice is further support for the view put forward so cogently by R. G. Macfarlane[3] that haemostasis is first secured by vascular contraction and is only secondarily dependent on the coagulation of the blood.

1 *Proc. Soc. exp. Biol. N.Y.*, 1941, **48**, 217.
2 *Amer. J. Physiol.*, 1942, **135**, 547.

TRANSFUSION OF BOVINE PLASMA AND SERUM

Experience in treating the casualties of total war has emphasized the need for combating shock by the transfusion of fluids with a high protein content: human blood, plasma, and serum have all proved their worth. In this country there has been no lack of human material; in the U.S.A. it has been felt the demand might outrun the supply. Attention has therefore been directed to the use of bovine plasma and serum. The first detailed published report[4] from the University of Minnesota describes the use of bovine products in 120 cases. As the authors state, the incidence of reactions was sufficient to contraindicate any clinical use of whole bovine serum or plasma. Both were shown to contain haemolysins and haemagglutinins to human red cells. Most of the haemolysins and about 50% of the haemagglutinins could be removed by adsorption on human red blood cells. By so doing the incidence of reactions was reduced from 66.6% to 24.5%. A preliminary skin test was done on all patients, using 0.1 c.cm. of 1 in 10 dilution of serum with normal saline. In a preliminary series of observations patients who showed pronounced skin wheals were found not to take serum well and were therefore not used subsequently. Following the skin test 0.1 c.cm. of bovine serum diluted to 1 c.cm. with normal saline was given intravenously. Several hours later, if no reaction occurred, 1 c.cm. diluted to 10 c.cm. with normal saline solution was given intravenously; next day 5 c.cm. diluted to 10 c.cm. was given, and, somewhat later, 50 c.cm. diluted to 100 c.cm. If no reaction occurred, amounts of 250 c.cm. diluted with an equal amount of saline or 5% dextrose were injected, the rate of administration being slow. About 50% of reactions were febrile in character, usually indicated by a chill one-half to 1 hour after the start of the injection. Other reactions, such as immediate urticaria, oedema of eyelids, flushing of skin, backaches, gastro-intestinal upsets with diarrhoea and vomiting, dizziness, and severe anaphylactic reactions, made up the remainder. No significant difference was found between serum and plasma. Three severe anaphylactic reactions occurred with extremely small doses of 2 c.cm., 0.1 c.cm., and 0.1 c.cm. respectively. Skin tests gave no indication of this sensitivity. Delayed reactions, characterized by generalized urticaria, oedema, and gastro-enteritis, occurred in about 60% of patients 3 to 10 days after the final injection. They lasted 48 to 72 hours. The majority of the patients suffered from inoperable carcinoma; two patients with shock were treated with success. Six patients were given re-injections of whole bovine plasma and serum after variable intervals, and these showed an anaphylactic type of response.

The authors suggest that the preparation of a satisfactory product of bovine albumin from which the globulin fraction has been eliminated completely may prove a safe and satisfactory blood substitute. Milton E. Veldee[5] has recently reported that E. J. Cohn[6] has prepared such an albumin fraction from human serum which has given satisfactory results on clinical trial. The advantages of the fractionation of human serum which has proved its value when given in bulk are not altogether clear, but the value of such treatment in the case of a foreign serum are more obvious, and further reports will be awaited with interest.

3 *Quart. J. Med.*, 194 **10**, 1.
4 Kremen, A. J., Hall, H., Koschnitzke, H. K., and Stevens, B., *Surgery*, 1942, **11**, 333.
5 *Amer. J. Publ. Hlth.*, 1942, **32**, 289.
6 *Chem. Rev.*, 1941, **28**, 395.

DEVELOPMENT OF THE EMERGENCY BLOOD TRANSFUSION SCHEME

BY

L. W. PROGER, M.R.C.S.

Medical Officer In Charge of Blood Transfusion at the Ministry of Health

Peacetime Service.—In this country the blood donor has always reg ded his work as a voluntary social service. Twenty years ago, in Camberwell, Mr. R. L. Oliver founded the association of voluntary donors which later became the British Red Cross Transfusion Service—the first of its kind in the world—and this led to the development of a number of similar organizations throughout the country. These organizations undertook to provide hospitals with accredited donors of the required blood group at short notice, and their members were prepared to attend the hospitals at any hour of the day or night. Contributions could be made towards the cost of the service, but the donors were always volunteers. The introduction of blood storage at many of the large hospitals during the past six years was an important advance in technical methods, since tested blood could always be kept ready for an emergency case, and it was no longer necessary to call donors at inconvenient hours. However, the use of individual donors remained general until recent times, and is still the method of choice in the treatment of certain cases.

Pre-war Preparations.—During the months of political tension after September, 1938, recent advances in transfusion methods were constantly under discussion, especially in view of the success achieved in the Civil War in Spain, where stored blood was carried to Army medical units in the field and was also used for the treatment of air-raid casualties in the large cities. It seemed clear that the quantity of blood required under the conditions of modern war would be beyond the scope of the peacetime donor services, and that special arrangements would be required. London, with its vast concentrated population dependent on a complex system of transport and supply, presented a transfusion problem of special importance, and the Medical Research Council undertook to establish, on behalf of the Ministry of Health, four Blood Supply Depots in the outer suburbs. These depots, which are still under the direct control of the Council, were designed to store blood collected from panels of voluntary donors enrolled in the Home Counties, with the object of supplementing the local arrangements of hospitals in the central area, which were more likely to become disorganized. At the same time arrangements were made to establish an Army Transfusion Service, and it was agreed that since this service would enrol all the available donors in the South-Western Counties it would also supply the emergency needs of the civilian hospitals in the area.

The First Year of War.—From the outset stores of blood were available, and during the early months of the war the four London depots were enabled to perfect their arrangements and to carry out valuable research work on the storage and preservation of blood. At the same time the voluntary transfusion organizations throughout the country increased their activities, and emergency blood stores were established in many of the large cities. On the outbreak of war the Army Transfusion Service was faced with the problem of transporting blood to the B.E.F. in France—a problem made all the more difficult by the fact that blood cannot be stored for more than 2 to 3 weeks, and special precautions have to be taken against the damaging effects of shaking in transit. A large reserve store could not therefore be built up so long as there was no demand for its use. On the other hand, the service had to be prepared at any moment to start bleeding large numbers of donors. It speaks highly for the success of the organization that during the first three days of the invasion of the Low Countries approximately 800 bottles of blood were dispatched to France, enabling the forward medical units to be adequately supplied and the base store to be replenished. Although the forward units were soon isolated from further supplies, some 500 transfusions were given during the retreat from Belgium and the evacuation from the beaches under the most adverse conditions.

Introduction of Plasma and Serum as Substitutes for Blood

In America experimental research on blood substitutes had demonstrated that plasma—the fluid portion of blood after removal of the red cells—provided a reliable substitute for whole blood, and had the advantage that it could be stored for many months without deterioration. In addition, its recovery avoided the wastage of blood which was not used within the safe storage period, and, moreover, plasma could be safely given to patients of any of the four blood groups. This discovery was of the greatest importance, especially to the armed Forces which required supplies in distant theatres of war. The first American product—plasma-saline—had certain theoretical disadvantages in that the method of preparation required considerable dilution, which not only doubled the weight and bulk to be transported but also increased the volume of the effective dose to be administered. Moreover, Federal Government regulations required that antiseptic should be added to ensure sterility, and many considered that this might be injurious to debilitated civilian casualties. Investigations continued, and the Army Transfusion Service developed a method by which undiluted plasma could be bacteriologically filtered, thus ensuring a clear sterile product which could safely be transported over-seas without the need for refrigeration. The value of serum—the fluid separated from blood after it has clotted—was being investigated by the Medical Research Council, especially in relation to the treatment of shock resulting from air-raid casualties and burns, and this also proved to be a valuable substitute for whole blood. Serum is more easily filtered than plasma, and has similar keeping properties, but, since the blood has to be specially drawn for its preparation, it does not have the advantage that plasma has in being a natural recovery product from the blood stores.

The Regional Scheme

After the capitulation of France and the return of the B.E.F. in June, 1940, the position called for urgent review, since no part of the country could now be regarded as more than relatively immune from air attack. The Ministry of Health therefore undertook to co-ordinate and extend, where necessary, the blood transfusion services throughout England and Wales, with the primary object of ensuring that an adequate supply of transfusion fluids and standard apparatus was made available for the treatment of casualties. Nine Regional Blood Transfusion Officers were appointed. The schemes developed under their direction, with the organizations set up in the London area by the Medical Research Council and the Army Blood Transfusion Service centred in a South-Western town, cover the whole of England and Wales. Similar organizations have been established in Scotland and Northern Ireland. The schemes developed by the Regional Blood Transfusion Officers provide for financing the enrolment and testing of the additional donors required to meet emergency needs, the supply and distribution of the standard apparatus, and the establishment of laboratories for the preparation of the apparatus and the filtration of plasma and serum. Thus, during the past year there has developed a unified scheme in which the voluntary donor associations, the hospitals, the local authorities, and the Ministry of Health are co-operating with the fighting Services to provide a nation-wide emergency transfusion organization. Adequate blood stores are being maintained at important points throughout the country, so that every casualty hospital can obtain supplies to supplement its own resources. Plasma is recovered from these stores, so that wastage is reduced to a minimum, and, as stocks of plasma are built up, so each hospital will have its own reserve. Thus even the remotest hospital will have transfusion fluids ready for immediate use, leaving time for blood to be brought from the nearest stores should this be required.

Research work is co-ordinated by a representative committee of the Medical Research Council, which keeps in close touch with work going on in the Dominions and America, so that each centre is kept informed of the most recent developments.

Introduction of Dried Plasma and Serum for Transfusion

The preservation of unstable fluids such as milk by drying has been the subject of investigation for many years. More recent research, both in America and in this country, has shown

that even more unstable fluids may be preserved without change by drying from the frozen state, and this knowledge has now been turned to the use of the Transfusion Services. In January, 1940, the Medical Research Council extended its experimental serum-drying unit, since it was foreseen that a demand for dried transfusion fluid by the fighting Services would arise. This unit had developed a process whereby large volumes of serum or plasma could be treated and a high degree of dryness obtained. The method of drying from the frozen state reduced protein changes to a minimum, and tests indicated that the dried product was capable of preservation for many years without deterioration. Moreover, the dried product could be quickly reconstituted for use by the addition of the appropriate quantity of distilled water.

When the Ministry of Health Regional Blood Transfusion Scheme was under consideration in July, 1940, the Wellcome Trustees offered the M.R.C. a grant to meet some urgent national need. The Council suggested that the grant should be used to provide another drying plant. Towards the end of the year the Army Blood Transfusion Service arranged to set up a similar plant to meet the growing needs of the oversea Forces. In conjunction with the Medical Research Council they devised an improved method for the freezing of the plasma or serum in the standard bottle preparatory to the drying process. By rotating the bottle at a high speed in a low-temperature cabinet the fluid was forced on to the sides of the bottle and freezing occurred almost instantaneously. This spin-freezing method produces a better-quality dried product which redissolves more readily than that produced by earlier methods. A supply of transfusion fluids is thus assured in a form which can be dispatched to any part of the world.

Working Arrangements

Co-operation with the Fighting Services.—Close co-operation has been maintained with the transfusion officers of the Army Command areas, from whom much assistance has been obtained during the period of development. The Royal Naval and Air Force Medical Services have also adopted for emergency transfusions the dried products, which are especially suited to their requirements. Arrangements have been made whereby the Home Stations of the R.A.F. may use the facilities provided under the Regional Scheme, so that adequate supplies of stored blood and plasma will be available. The R.A.F. Mobile Transfusion Team is giving valuable assistance in maintaining supplies.

The Large-scale Bleeding of Donors in Wartime.—In normal times a donor can always be found to attend at a hospital when needed, but, when dealing with the large numbers required to build a reserve of plasma and to maintain war emergency blood stores, sufficient donors are seldom able to attend during working hours, as the hospital may be a considerable distance from their work. Moreover, even the large hospitals cannot always be relied upon to provide the necessary staff and accommodation without interfering with their normal duties. For this reason mobile teams have been established; these can set up bleeding centres at places convenient to the donors, such as first-aid posts, village halls, cottage hospitals, or at factories. Even in these difficult times factory managements have been most helpful, and in many cases the factory organizes its own donor panel and provides on regular days the agreed number of donors from members of the staff chosen so as not to interfere with production.

Publicity Campaign for Donors.—Hundreds of thousands of volunteers have been enrolled and many thousands have already given their blood, some on more than one occasion. The difficult task of launching publicity campaigns strong enough to attract the number of donors required and yet restricted to the desired locality has been successfully accomplished with the valuable assistance of the Press and local voluntary associations. Donors sometimes remark that, while their services have not yet been called upon, active campaigns for more donors are proceeding in other districts. It will be appreciated, however, that the donor panels should bear some relation to the density of the population. To provide for the constant movement of the population, for local disturbances due to air raids, and for other factors which interfere with the attendance of donors at the centres, the panels must be larger than the needs of the moment appear to justify.

Donors' Obligations.—The calling up of large numbers of donors, the assembly of the necessary staff and equipment at the bleeding centre, and the distribution of the blood collected is a complicated matter involving much clerical work and planning in advance. This is not always appreciated by donors, who may think, especially in quiet periods, that their services are not really needed. It occasionally happens that only half the number of donors called arrive at the bleeding centres. This may result in the team of doctors and nurses being kept unoccupied for several hours, the work of the filtration laboratory staff being held up, a promised consignment failing to be sent to the drying plant, or a group of hospitals being kept short of supplies of fresh blood. In addition, there is the extra clerical work in tracing the absent donors and rearranging their index cards. With adequate donor panels it should not be necessary to call a volunteer more than twice a year provided all the donors are prepared to do their utmost to attend when required.

The Present Position

Full advantage has been taken of the relatively quiet period during the past twelve months to build up stocks of plasma, so that even the remotest hospital will have its own emergency reserve. Improvements in the filtration process have been introduced, and contributions are being made towards the supply of dried products for the fighting Services. One of the effects of these emergency measures, and the wider understanding of modern methods, has been the increasing use of transfusion in the treatment of the ordinary sick and injured in the hospitals. Although the need for building up of emergency plasma stocks has now largely been met, the blood stores must be maintained. This will entail the continued bleeding of donors, but now that the filtration and drying processes are in full operation there need be no fear that the blood will be wasted.

Accurate figures have been difficult to obtain, but the following estimates give a fair picture of the present position:

Up to the end of 1941 over 800,000 donors had been enrolled, but, for a number of reasons, a large proportion of these are not always available on the active lists. During the last half of 1941 some 180,000 pints of blood were collected. 32,000 pints of this blood were used in hospitals for the treatment of both Service and civilian patients, including war casualties; the remainder has been converted into plasma or serum. Over 10,000 pints of this plasma and serum have been used for transfusions, a proportion has been dried for the use of the Navy and Air Force, and the remainder has been distributed among the hospitals to provide an emergency reserve. In addition to this, the Army Transfusion Service has collected over 100,000 pints of blood for the preparation of dried plasma for the use of Army medical units over-seas, apart from the provision it has made for supplying civilian hospitals in the South-Western Region.

Success depends in a large measure on the maintenance by the donors of that spirit of voluntary social service shown so conspicuously by the first associations of twenty years ago.

The Chartered Society of Massage and Medical Gymnastics is arranging to hold its annual congress on Friday and Saturday, September 18 and 19, in the Great Hall of B.M.A. House, Tavistock Square, W.C. On September 18 at 2 p.m. Prof. J. A. Ryle will lecture on "The Re-making of Man"; at 3.30 Prof. F. R. Fraser will lecture on "The Place of Rehabilitation in the Treatment of Patients," and at 6 Lord Horder, President of the Society, will give the founders' lecture on "Rehabilitation: the Part Played by Physical Medicine." On September 19 at 10 a.m. Surgeon Lieut.-Commander J. Bunyan will lecture on "The Treatment of Wounds and Burns by the Envelope Method," illustrated by a film, and at 11.30 Dr. Vaclav Benes on "Physical Training Organization in Czechoslovakia." These meetings are open to all medical practitioners. The annual general meeting, open only to members, will be held at 2 p.m. Further particulars may be had from the secretary, C.S.M.M.G., Mount Lodge, Amersham, Bucks.

DEHYDRATION OF FOODS

The Nutrition Society and the Food Group of the Society of Chemical Industry held, in the Great Hall of B.M.A. House, their first joint meeting on July 25. The occasion was notable for this itself, indicating collaboration in those areas of scientific and technical inquiry where the territories of nutritionists and food technologists overlap. The meeting was also of particular interest in that it provided an occasion for members of the scientific staff of the Food Investigation Board (of the Department of Scientific and Industrial Research) to report to an expert audience the results of work on which they have been engaged during the last three years, work that may have a profound effect on the nutrition of the people, in peace as well as in war.

Sir EDWARD APPLETON, Secretary of the Department of Scientific and Industrial Research, who took the chair at the morning session, drew attention to the part played by his Department in arranging and supporting the laboratory work necessary as a foundation for subsequent technological development. Dehydration processes were to be regarded as a means of avoiding the annual importation of 3 million tons of water included in imported foods. It had the further advantage of making possible the storage of foodstuffs at ordinary temperatures without refrigeration, as well as facilitating transport, which Sir Edward described as "storage on the move." He also referred to the effect of pre-drying treatment and to the quality of the raw material as having an important influence on the finished product, and necessitating scientific investigation just as much as conditions during drying and methods of packing. In this connexion he quoted Sir William Hardy's famous dictum that you must be clear about the biology before you come to engineering. Sir Edward paid a tribute to Mr. ERIC BARNARD, Director of Food Investigation in the Department, to Dr. FRANKLIN KIDD, Director of the Low Temperature Research Station at Cambridge, where the technical work is being carried out, and to Dr. LESLIE HARRIS, Director of the Dunn Nutritional Laboratory in Cambridge, who collaborated by arranging for the conduct of tests to ensure that the processes used should not lead to serious loss of nutritive value. Assistance had also been received from firms and individuals in industry, and Sir Edward hoped that this collaboration would continue.

Principles and Practice

Dr. FRANKLIN KIDD then outlined the principles and practice of food dehydration. He emphasized the importance of giving the fresh foods a preliminary heat treatment before submitting them to any of the approved processes of dehydration. The destruction of enzymes, especially those catalysing the decomposition of vitamins, was probably the chief effect of this blanching or scalding, but the preservation of good appearance and palatability would seem also to be partly due to that treatment. Dr. Kidd emphasized the need for reducing the volume as well as the weight by processes of dehydration, so that transport space might be minimized. Stabilization of dehydrated foods was secured by the exclusion of oxygen and moisture, and sometimes by the use of antioxidants during processing; exclusion of certain catalytic metals, particularly copper, was also sometimes potent in improving quality and stability. Attention had to be paid both to upper and to lower limits of temperature, as well as to the need for removing moisture as rapidly as possible. Of the various methods of drying, to which Dr. E. C. BATE-SMITH called attention in the second paper, warm-air drying in tunnels appeared at present to be the most practical.

Results with High-protein Foods

Dr. BATE-SMITH then presented a paper of which he, Dr. E. M. CRUICKSHANK, and Dr. J. G. SHARP were co-authors. After describing six different types of drier, three of them steam-heated, with or without vacuum, and the other three dependent upon moving currents of air, he dwelt briefly on the special features of meat and eggs, determined by the fact that they were high-protein foods and not primarily sources of heat-labile vitamins. The drying of meat at 80° C. in properly constructed plant and with proper control involved no losses in palatability or in the biological value of the protein and only small losses of aneurine, in which meat (except pork) is, in any event, not particularly rich. The technique of drying makes it impossible to dry meat except when relatively finely minced, and the dried meat products so far made available are, therefore, limited to use in dishes like mince and cottage pie. As those attending the meeting had an opportunity of establishing for themselves during the lunch interval, the palatability of these dishes made with dehydrated food is no whit less than that of the corresponding dishes made with fresh meat. The need for dried egg powder to be "soluble"—that is, for it to reconstitute with water to something as close as possible in physical properties to the mixed white and yolk of fresh eggs—sets a limit to the processes available for drying. Spray drying conserved the whole of the fat-soluble vitamins in egg, though it involved some losses of aneurine, but the best commercial products from America were equal in nutritive value to equivalent quantities of home-laid fresh eggs. Assessment of palatability, a complex phenomenon, had been made possible by the use of tasting panels, which gave unexpectedly uniform results. Certain problems still awaited solution, particularly the varying deterioration during storage, some samples being stable for periods of a year or longer and others losing their attractiveness fairly rapidly. Storage in closed containers was essential in order to exclude moisture, but it had not been found necessary to pack egg powder in an inert gas.

Dr. G. A. REAY of the Torry Research Station, Aberdeen, describing the work on the drying of fish conducted under his direction, said that freezing methods had not been found satisfactory, although they marked a very great improvement on traditional methods of slow sun- or air-drying. By roller-drying a fish "lace" was produced, and certain types of this had been found very suitable for fish-cakes. In general, however, kiln-drying in the kind of heater used for kippering had been found the best method when following an appropriate period of pre-cooking. Minced fillets were treated in this way, and the resulting product permitted, as was shown by figures that Dr. Reay quoted, a very large saving of storage and transport space. During the discussion on this part of the meeting, Mr. NEVILLE WRIGHT of the New Zealand High Commissioner's Office referred to the immense saving in shipping space that would be effected if more dried meat were produced in the Dominions and shipped to this country in the dehydrated form. Much work needed to be done, and a good deal was already in hand, to bridge the gap between laboratory experiments and commercial production. Data on plant design were not yet available, and it would be well to secure close collaboration with engineering firms with a view to producing the most suitable plant in the shortest possible time. Investigation was also required into the engineering side of packing dehydrated foods. Mr. Wright made a strong appeal for an international exchange of information on these and allied matters.

After Dr. A. S. MACFARLANE had spoken about the theoretical advantages and the practical difficulty of freeze-drying and the bulkiness of dehydrated foods that was essential if they were to reconstitute properly, Dr. R. T. COLEGATE, demonstrated the difference between air drying and high-vacuum drying with an exhibit of vacuum-dried gluten having a phenomenally high volume-to-weight ratio and yet easily broken down into a powder. This demonstration evoked considerable applause from an audience that was obviously now prepared not only to consume its lunch, but also to samples dishes made with dehydrated foods. This was done after contributors to the discussion had replied, and the dishes made from reconstituted dried meats, dried carrots, dried cabbage, and dried potatoes were highly praised. Bench demonstration in the morning of rehydration of cabbage reminded one very much of the "magic gardens" in the tumblers of one's youth, but differed in that the latter have no characteristic aroma. A similar demonstration with a block of dehydrated potatoes, which was rapidly converted into a good dish of the mashed vegetable

before the eyes of the expert and critical audience, was one of the features of the afternoon's meeting, when the chair was taken by Dr. H. E. Cox, Chairman of the Food Group, in the unavoidable absence of Dr. L. H. LAMPITT.

Value of Pre-heating

Discussing the dehydration of vegetables, particularly of cabbage, but also of carrots and potatoes, Dr. W. J. R. Allen said that the preservation of colour and of ascorbic acid in cabbage appeared to be effected by similar means, including scalding before drying, use of sulphite, and choice of appropriate drying temperatures. Dr. L. W. MAPSON, who, with Dr. J. BARKER, was co-author of this paper, when replying later to the discussion, emphasized the importance of the technique of serial scalds, whereby there was built up for the pre-heating process a solution sufficiently rich in ascorbic acid and other solutes to prevent serious loss from the batch of material being scalded. Particularly interesting was the suggestion that the boiling of carrots in water previously used for the boiling of carrot tops and then strained could actually provide the consumer with a cooked carrot containing more vitamin C than the raw root. Dr. Allen stated that no loss of carotene occurred during the proper drying of carrots, and that the strain of potato used must be taken into account when determining the technique of drying, for this affected the final product. He also gave the warning that losses of aneurine, as might have been expected from chemical considerations, unlike those of ascorbic acid, were not mitigated by the use of sulphite. Mr. L. U. CHARLEY, who opened the discussion on this paper, emphasized that dehydration offered possibilities of saving food that might otherwise go to waste, and instanced the possibility of using the outer leaves of cabbages, which appear to be very much softened by the dehydrating process, and the large and mis-shapen carrots which normally may not find a market. Mr. T. RENDLE laid stress on the importance of pilot plant work, and Mr. B. G. MCLELLAN on the possibilities of domestic drying. In his reply, Dr. Mapson also indicated how the use of dried foods, by expediting procedure in canteens and other communal kitchens, might effect a further saving in nutrients that were progressively destroyed on the hot-plate.

Sir JOSEPH BARCROFT presented a final paper on the place that dried foods might and ought to have in the general food economy of nations. In his opinion, desiccation of foods, because of the considerations that had been put forward at the meeting, would put a premium on quality; only the inefficient and unscrupulous producer of fresh food need fear competition from the new technique. Sir Joseph also discussed the two different kinds of glut, the seasonal and foreseeable, and the casual and unpredictable, and expressed the view that the use of dehydrated foods in the kitchen might at one and the same time make communal feeding easier, and help to put the family as an institution on its legs again. Squadron Leader T. F. MACRAE followed this more theoretical consideration with some practical data on experience of dehydrated foods in the R.A.F. He was able to show, from experiments with considerable numbers of personnel as well as from laboratory tests, that these foods are not at all inferior in palatability or nutritive value to fresh counterparts. Indeed, it would not be going too far to claim that the dehydrated foods, as consumed, had a higher content of ascorbic acid and were less liable to be left on the plate than were the cooked fresh foods.

Dr. JOHN HAMMOND discussed the effect of the possible bearing of dehydration, with an adequate and planned distribution of dehydrating plants, on agricultural production, and anticipated that it might well lead to increased food production in hitherto unexploited districts. In the absence of refrigeration, shortage of storage space in certain countries had been a bugbear to those planning post-war relief work, and dehydrated foods might help to save the situation. Greater availability of semi-prepared foods might help to reduce the drudgery of household labour and lower the cost of high quality food, thus also making out-of-season products available to people of moderate incomes.

The chairman, Dr. H. E. Cox, in closing emphasized that the subject presented two main problems: the post-war problem, when considerations of costing and economics would play an important part in determining the scope of food dehydration; and the food problem of the present time, when it was a matter of extreme urgency to use all methods so far available to conserve the food of the nation and maintain its nutritive value. This concluded proceedings that had obviously been of outstanding interest; the Great Hall was full, and at certain times there were numbers of members or visitors in the gallery or standing at the back of the hall. Something approaching 500 people must have attended in the course of the day, and these included a very high proportion of those most active in the parallel fields of nutritional research and food technology. The day's work was of value not only for the old information that it summarized and the new that it made public for the first time, but also for the contacts that it initiated or renewed between groups of workers, all of whom are essential for the full application of scientific knowledge to the problem of nutrition and human health.

DIPHTHERIA IMMUNIZATION CAMPAIGN

The Government is opening a campaign for more complete immunization of the child population against diphtheria. To inaugurate the campaign in the London region the Ministry of Information summoned a press conference at County Hall, when addresses were given by three medical officers of health. Dr. W. Allen Daley, medical officer of health of the London County Council, said that in 25 out of the 29 metropolitan boroughs immunization was now carried out at the schools, either by the county council or borough council medical officers, while school medical officers, nurses, and teachers were co-operating to induce parents to sign the consent form. He estimated that 36% of the children now in London were protected against diphtheria, a great advance on the position in 1937, when the figure was 5.3%, but far below the 75% which would be judged satisfactory. He mentioned the examples of Scotland (where the figures were 54% for the "under fives" and 71% for school children), of Montreal and Hamilton in Canada, and of New York. In New York an intensive campaign was begun in 1929, when the deaths from diphtheria were 463 in the year, and by 1940 they had declined progressively to 10. In the county of London the notifications, which were just over 7,000 in 1936, fell to under 2,000 in 1940, and the deaths from 226 to 40, but there was a rise in both notifications and deaths in 1941. Dr. Daley's remarks were supported by Dr. H. Geffen, president of the Home Counties Branch of the Society of Medical Officers of Health, who, speaking of a total of 57 districts in the Home Counties, with a child population of over half a million, said that 35% of those under 5 and 48% of those between 5 and 15 had now been immunized, but the important thing to secure was the immunization of the young child at the age of 1 year or thereabouts. Dr. Geffen said that there was some evidence that parents were deterred from giving consent owing to the experience of the father, if on active service, of an unpleasant inoculation for typhoid or dysentery. It should be emphasized in the campaign that antidiphtheria injections were practically painless and without unfortunate after-effects. He was asked if general practitioners could not be given the means of carrying out free immunization, to which he replied that he agreed in principle, but mass immunization at the municipal clinic was quicker, easier, and more economical. The general practitioner could not deal with large numbers at any one time, and therefore must be provided with a more expensive reagent and one more difficult to make than that which served the purpose of mass immunizations. Dr. G. Macdonald, as representing the Borough Medical Officers Committee, said that all the medical officers were enthusiastically behind the Ministry of Health in this campaign. Diphtheria immunization was beyond the stage of experiment, it was easy to administer, safe, and capable at the very lowest of protecting 90% of the child population submitted to it.

Full details of the Government's programme and a comprehensive guide on the planning of local campaigns are contained in a pamphlet which has been sent to all welfare authorities in England and Wales. The first part outlines the Ministry's central publicity, which will include advertisements in Sunday newspapers and a wide list of periodicals; broad-

casts; editorial publicity; trailer films; and national displays in 1,200 shop windows during August. The second part deals with the facilities which are being provided to assist local authorities' publicity, including stereos for local newspaper advertising (which can be obtained free of charge from the Public Relations Division of the Ministry of Health); cinema slides; the sound film 'Defeat Diphtheria"; and a 4-page leaflet, a shop window poster, and a public transport vehicle bill produced by the Central Council for Health Education. Recommendations for local campaigns cover such points as timing and duration, press advertising, press conferences, and supporting material.

APPROVED NAMES OF DRUGS

The General Medical Council has approved names for certain substances which are now being produced, or are likely shortly to be produced, by British manufacturers, in some instances under licences granted by the Comptroller-General of Patents, Designs, and Trade Marks. These substances have hitherto been known under other names, which are given below together with the names now approved. The question of including them in the *British Pharmacopoeia* is under consideration, and if any of them is included the intention is that the approved name given below will be its official title.

Approved Names	*Other Names*
Dienoestrol	Di-*p*-hydroxyphenylhexadiene
Pheniodol	Biliselectan
Ethisterone	Ethinyltestosterone
	Lutocyclin
	Lutogyl
	Pregneninolone
	Progestoral
	Proluton C

It is hoped that the early publication of these approved names may lead to their general adoption.

RECENT ADVANCES IN DRUG THERAPY

In an interesting article on recent advances in drug therapy, L. S. Goodman (*Bull. N.Y. Acad. Med.*, 1942, **18**, 112) makes the following observations. The local use of sulphonamide drugs has somewhat overshadowed the fact that their oral administration is a useful prophylactic in the quiescent state of rheumatic fever, in scarlet fever contacts when the Dick test is positive, and in meningococcus carriers—among other conditions. Theophylline is an effective bronchial antispasmodic, as are the synthetic substitutes for atropine—namely, novatropine, eumydrine, syntropan, and trasentin. Referring to the various vitamins now in use, he stresses the need for employing them therapeutically only when there is a definite deficiency. Quinine has been found to be effective in the symptomatic treatment of myotonia congenita. Papaverine is a useful vasodilator in the emergency treatment of arterial embolism. Goodman points out that the newer and purified digitalis glycosides (e.g., the lanatosides A, B, and C) are more expensive than digitalis leaf, and that the burden of proof that they are better than the leaf still rests on those making such a claim. Benzedrine, he notes, is especially useful in the treatment of narcolepsy, and may prove a valuable adjuvant to phenobarbital for epilepsy and to the belladonna alkaloids for post-encephalitic Parkinsonism. He observes that no untoward symptoms have resulted from the treatment of threadworms with phenothiazine (the experience in this country is different). From 1929 to 1941 an extensive research on morphine was undertaken jointly by the National Research Council, the Narcotic Bureau of the U.S. Public Health Service, and the Universities of Virginia and Michigan. Of the many substitutes synthesized, the most promising was "metopon," a methyl derivative of dilaudid.

Goodman observes that the use of desoxycorticosterone or other cortical hormones in the prophylaxis and the treatment of shock is still a questionable procedure. He states that desoxycorticosterone increases the blood volume "by a renal mechanism." But the problem of shock is not loss of circulating fluid through the kidneys, but rather through widely dilated or injured capillaries. Until, therefore, it has been shown that the adrenal cortical hormones influence the distribution of body fluids by affecting the permeability of capillaries, their use in shock must be viewed sceptically.

Correspondence

Megaloblastic Anaemia of Pregnancy and the Puerperium

SIR,—In reply to the letter by Dr. M. L. Thomson (Aug. 15, p. 198), which criticizes our communication of July 11 (p. 31), we beg to submit the following observations.

1. We are in full agreement with the dictum that "discussion demands a clear definition of the 'megaloblast,'" but unfortunately, as your correspondent observes, "dissension exists on this point." We are indeed surprised to learn that Dr. Thomson proposes to confine the term "megaloblast" to the "haemoglobinated" classical megaloblast of Ehrlich. The type "A" megaloblast of Israels is described by this author as a large cell with dark blue (non-haemoglobinized) cytoplasm, which in pernicious anaemia may constitute as many as 41.8% of the total marrow cells in sternal puncture films. Your correspondent is apparently labouring under the impression that all large basophilic red cell precursors are "proerythroblasts." If this be so we would suggest that before undertaking to publicize the haematological doctrines of Israels he should seek further instruction from his mentor.

In our view the adjective megaloblastic as applied to marrow films is warranted when a high proportion of the red cell precursors are of a primitive type—i.e., large cells with abundant basophil cytoplasm and a large nucleus displaying a finely reticulated nucleoplasm. Such cells may appear occasionally in many conditions, but in our experience are only found in large numbers in anaemias due to deficiency of the liver principle. In his published descriptions Israels distinguishes his type "A" megaloblast from the proerythroblast solely by certain details of nuclear morphology. We are of the opinion that these distinguishing features are not sufficiently constant or well defined for their ready recognition. However, from the practical point of view this is of little importance, as the proerythroblast of Israels is not found in considerable numbers in marrow films except in conditions where megaloblasts also are numerous. Having exchanged slides and engaged in an amicable and, we trust, mutually helpful correspondence with Israels, we feel that although we may differ from him on certain cytological points of considerable academic interest we are unlikely to disagree over the recognition of a megaloblastic marrow film.

We admit that the value of our paper might have been enhanced to haematologists by the inclusion of photomicrographs and detailed cytological descriptions, but as the paper was addressed primarily to practising clinicians we did not consider that such a course was called for in view of the need for economizing in space, and, furthermore, because detailed illustrated descriptions of the erythroblast series of cells had recently been published by us in the *Quarterly Journal of Medicine*, to which a reference was given in our paper.

2. Your correspondent takes exception to the inclusion in our series of 3 cases in which sternal puncture was not done. That sternal marrow films were not available in these 3 cases is regretted by none more than ourselves. Perhaps we should have omitted these cases, but in view of the rarity of this type of anaemia of pregnancy we did not consider it unreasonable to include them, as in their peripheral blood findings, clinical features, and response to treatment they displayed such a similarity to the 13 cases in which the sternal marrow was investigated. We fully admit that in these 3 cases concrete proof of the anaemia being megaloblastic is lacking, and if Dr. Thomson chooses to regard a severe anaemia with a colour index of 1.33 which responded with a reticulocyte crisis to an injection of liver extract as normoblastic in origin, he is obviously entitled to his opinion. Presumably he refuses to regard his cases of Addisonian pernicious anaemia as megaloblastic unless sternal puncture has been performed.

3. Your correspondent inquires on what grounds was our Case 9 included as a megaloblastic anaemia. It was regarded as a megaloblastic anaemia because in the sternal marrow film large numbers of megaloblasts were present. Although many

normoblasts were also present in the bone marrow this is to be expected when the red cell count is over 3,000,000. The relative increase of normoblasts in association with a low colour index (0.75) was attributed by us to a dual deficiency of liver principle and iron, a combination which in our experience not uncommonly occurs.

The further criticism of certain of our cases in which sternal puncture could not be performed before the injection of liver extract had been started, we answer by stating that in each case the cytological findings were fully consistent with those observed by us in cases of Addisonian pernicious anaemia at varying time intervals after initiation of liver therapy.

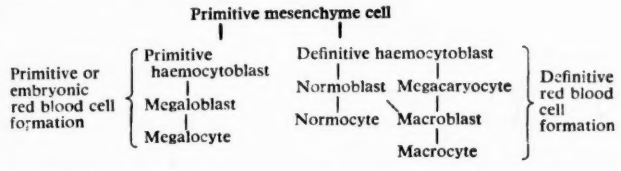
4. Your correspondent's dogmatic and unqualified statement that "the usual pernicious anaemia of pregnancy clears up after pregnancy" is, we consider, dangerous and unscientific, for unless it is realized that a considerable proportion of such cases may require intensive prolonged treatment and maintenance of life with blood transfusions, lives will be lost unnecessarily. It would be interesting to know upon what grounds he names such anaemias "pernicious," and whether he has studied their sternal marrow films.

In conclusion, we too would enter a plea. Although the history of haematology rivals that of theology in its sectarianism and doctrinal intolerance, surely the time has come when clinical haematologists should preserve a sense of proportion in their reactions to technical controversy. The heat engendered by discussions on cytological minutiae should not be allowed to obscure a clear appreciation of what is and what is not important in its practical application to diagnosis and treatment of diseases of the blood.—We are, etc.,

L. S. P. DAVIDSON.
L. J. DAVIS.
JAMES INNES.

Edinburgh.

SIR,—Embryologists have for long recognized that in the mammal there are two types of red blood cell formation—the primitive and the definitive. The primitive is concerned with the development of primitive mesenchyme cells into primitive haemocytoblasts and thereafter into megaloblasts and megalocytes; the definitive with their differentiation into definitive haemocytoblasts and thereafter into macroblasts and macrocytes, normoblasts and normocytes. These changes may be represented schematically as follows:



Ehrlich held the view that in pernicious anaemia red blood formation had reverted to the primitive type; according to him also the megaloblast was a large haemoglobin-containing cell with a leptochromatic nucleus, which was to be found in small numbers in the circulating blood of patients with pernicious anaemia. This cell ripened into the non-nucleated form, the megalocyte. At a later date Nägeli described two other cells of definitive lineage—the macroblast and the macrocyte—as occurring in the blood in certain conditions. Where this takes place the marrow is organically and physiologically sound, but, owing to certain adverse influences, the removal of which brings about restitution to normality, it is for the time being functioning abnormally. In pernicious anaemia, however, with its megalocytic blood formation, the marrow is the subject of organic disease without known cause capable of removal.

Peabody, who was regarded as the authority on the subject, was of opinion that the predominant cell in the marrow in pernicious anaemia cases was the megaloblast. In 1928, however, I pointed out that his megaloblast was in reality a haemocytoblast; and later (1934) Turnbull expressed a similar opinion. There is, in fact, no justification historically, morphologically, or otherwise—indeed, on the contrary—for supplanting the haemocytoblast of the embryologist by the megaloblast of the haematologist in this setting.

In the diagram by Dr. M. L. Thomson (Aug. 15, p. 198), in which he presents schematically Israels's idea of red blood cell development, it will be seen that while the megaloblast is placed in a separate lineage from the normoblast, it is shown as ripening into the macrocyte, not the obvious megalocyte, to me a quite unintelligible procedure. It will be difficult, further, to justify the addition of the term "proerythroblast" (in place of the commonly employed "haemocytoblast") to the already overloaded and confused nomenclature. Again no distinction is drawn between primitive and definitive haemocytoblasts (proerythroblasts), with the result that, while the megaloblast has indeed been relegated to a separate lineage, the whole confusion arising from the idea that megaloblasts can develop into normoblasts still persists, the difficulty being merely shifted one stage backwards. Finally, while it may be supposed that the term "erythrocyte" in the diagram is really intended for "normocyte" I am unaware of any justification for the suggestion that the normoblast develops into the macrocyte.

Davidson, Davis, and Innes (July 11, p. 31) supply no evidence that the preponderant cell in the marrow of their cases is the megaloblast; and before the title of their paper can be justified it will have to be shown also that the condition they are dealing with is one concerned not with macroblasts and macrocytes but with megaloblasts and megalocytes. The facts are all against the possibility of this being realized.

Several other points, such as the function and fate of the megacaryocyte, the inner significance of anisocytosis with the simultaneous presence of megalocytes and microcytes, and the part played by deficit of liver agent in megalocytic and macrocytic anaemias respectively, could be elaborated, but as these have already been discussed elsewhere and are at present being dealt with again in an article in the Press, there is no necessity to consider them here.

—I am, etc.,

J. P. MCGOWAN.

Aberdeen.

SIR,—The article by Prof. L. S. P. Davidson, Dr. L. J. Davis, and Dr. James Innes (July 11, p. 31) is of great value to the obstetrician, as up to the present time few such thorough clinical investigations on that subject have been carried out. In 1931 I published one of the first follow-up cases of pernicious anaemia of pregnancy (*Zbl. Gynäk.*, 1931, No. 23, referred to in DeLee's *Principles and Practice of Obstetrics*, 1938). The case was that of a 25-year-old primipara, who was admitted to our clinic as a case of pre-eclampsia in labour. According to the history, the patient was well up to the third month. She then became pale and complained of dyspnoea on exertion, palpitations, dizziness. In the 10 days before admission she developed oedema of the ankles, headaches, and great weakness. The general examination of the very dyspnoeic patient made one think first of a decompensated mitral failure. The second stage of labour had to be shortened by forceps, followed by intravenous Ringer's drip infusion in view of the appearance of shock. Her condition improved. Urine: albumin+++, urobilinogen+++; stools: urobilinogen +++. The routine clinical examination after the confinement and the complete blood count showed most of the outstanding features of pernicious anaemia of pregnancy: R.B.C. 1,800,000, Hb 37%, colour index 1.02, W.B.C. 4,200, anisocytosis, macrocytosis, ovalocytosis, reticulocytes 110%. Under systematic liver therapy the patient was completely cured within four weeks and remained so, as the later post-natal examinations showed.

Such a case is important from the clinical point of view as many anaemic patients are often admitted to hospitals as cases of "toxaemia" or "congestive heart failure." It shows the need for early recognition of Aubertin's classical triad, "anaemia—dyspnoea—oedema," in routine ante-natal examinations, and, as the Edinburgh authors particularly emphasize, peripheral blood pictures and sternal marrow examinations in suspicious cases of anaemia in pregnancy. Labour brings about acute exacerbation of anaemia, which is the reason why early blood transfusions with vigorous haematinic treatment should be carried out after the diagnosis has been made.

The authors' proposal to replace the old-fashioned term "pernicious anaemia of pregnancy" by "megaloblastic anaemia of pregnancy" is certainly scientifically justified. The thorough differentiation of this type of anaemia from the cryptogenetic Addisonian–Biermer pernicious anaemia in view of the temporary duration has been pleaded formerly by obstetricians (Heim, 1923, Oettingen, 1924, in their works on pregnancy and pernicious anaemia).—I am, etc.,

WALTER SPITZER.

Surrey County Hospital, Kingston-on-Thames.

Treatment of Haemophilia

SIR,—Though the letter from Dr. R. G. Macfarlane and Prof. L. J. Witts (Aug. 1, p. 140) is most opportune in pointing the way to the management of haemophilia, it is necessary to admit that in this disease continued haemorrhage, even if slight, is a matter for serious concern and a source of great anxiety. The arrest of the bleeding at the site is an important part of the treatment and may be an urgent problem, and it is necessary to consider those measures which are ready to hand and can easily be applied. In the case which has led to this discussion it would appear that the bleeding was not arrested but was merely deviated, hence the extravasation into the tissues of the floor of the mouth and the fatal result. The course of events in this case emphasizes that, whatever measures are employed, it is essential that the bleeding should be arrested and not merely obscured. In order to bring this about in haemophilia some reliable haemostatic preparation must be brought into intimate contact with the bleeding area, and to accomplish this it is necessary to remove clots, debris, or soft oedematous granulations if they have had time to spring up. In my experience ordinary turpentine is an excellent haemostatic provided it is properly used. In the *Lancet* for July 31, 1915, I drew attention to the value of turpentine as a haemostatic, and was subsequently reminded by a correspondent that Billroth had extolled its virtues in his *Surgical Pathology and Therapeutics* (New Sydenham Society, 1877).

In dealing with a tooth socket the matter is quite straightforward. Under a good light the socket must be swabbed out until it is empty and as dry as the oozing will allow. A small strand of gauze or a strip of lint which has been soaked in turpentine and firmly squeezed out is then packed firmly into the socket. Any excess is cut off, and a small piece of folded dry lint or gauze is placed on top of the packed socket in order that it may soak up any excess of turpentine. It is only necessary to keep this pad in position for an hour or two. A conscious and intelligent patient may be able to hold it in position with the finger, thus exercising useful pressure; in other circumstances a rather bigger piece may be used and the jaws may be bandaged together, so that in this way the pad is kept in position and pressure is exercised. In about four days the socket plug will be found to be loosened by a slimy discharge, which follows the use of turpentine, thus enabling the plug to be easily withdrawn and without recurrence of bleeding. If, in the process of removing the plug, there should happen to be the slightest sign of recurrent haemorrhage the surgeon must be content to cut away that part of the plug which has already been loosened and the remainder must be left in position for another day or two. One other word of caution is necessary. The number of pledgets of lint or gauze must be carefully counted and recorded, for I have known a persistent sinus develop into the mouth as the result of a plug of this sort which was overlooked and left *in situ*.

I have used this plan in several cases of bleeding in haemophiliacs, not only from tooth sockets but from other situations, and with unvaried success. I therefore feel that I can recommend it as being convenient and efficient if properly used. Haemostatics like Russell's viper venom and some other preparations are stated to be very efficient, but they are not always readily obtainable, whereas turpentine is almost invariably to be had. Of course in these days the measures for the control of the haemophilic state will also be employed.—I am, etc.,

London, W.12. G. GREY TURNER.

Social Medicine

SIR,—We all welcome the establishment of a chair of social medicine as we welcome any new institution based on an ideal, but I trust that laymen who may chance to read recent letters on the subject will not get the idea that somehow the clinician or the laboratory worker has been to blame for the neglect of the subject hitherto. The profession has aways had those with ideals and willing to spend their energies freely in the public good. For example, the profession cannot be held responsible for the present state of affairs in regard to diphtheria, industrial fatigue, and tuberculosis. It surely ought not to be necessary for the Chief Medical Officer of the Ministry of Health to have to appeal to the public regarding immunization against diphtheria. Why it is not made compulsory only the politicians know, and meantime hundreds of children die annually from the disease!

In the same number of the *Journal* in which the new chair was announced (July 25) Dr. H. M. Vernon (p. 108) is reported as deploring the neglect of the investigations made during the last war in regard to industrial fatigue—made by official bodies at public expense. All who know anything of the subject are agreed that the application of many of the published findings would not only improve the health of the workers but would greatly increase our war output. Under the present wasteful system, which is responsible for the loss of millions of working hours, the workers, however, get more money, and the employers do not complain as it would otherwise go on the excess profits tax. We must not, however, decry this tax too much, for it is agreed that it has been chiefly responsible for the greatly increased facilities now given to medical officers. Many of the Government Departments are staffed by individuals so exhausted that they cannot be expected to administer as they ought and many are too tired to realize it. Increasing sick-leave will soon take its toll of those who really work hard too continuously.

With regard to tuberculosis the problem is more complex, but again is not so much one for the doctor as for the administrator and the public. Even if we could diagnose every case of tuberculosis in the country, what further could be done without a great change in the public attitude to the subject? It is too commonly forgotten that the young person who may feel quite well does not wish to be labelled tuberculous, while many a man with a positive sputum lives an effective life (and disseminates the disease presumably) for more than 20 years.

A first step in social medicine is the proper education of the public towards preventable disease, and we might begin in the universities, which ought to be the leaders of thought. There are still too many so-called educated people in the community who fail to recognize that a properly planned society, which is so essential in our overcrowded island, is impossible unless those who guide public opinion know more of the essential scientific facts upon which such a society must depend. All university students ought to have a compulsory course of social science, which would include instruction in the maintenance of health.

We must beware lest the new social medicine be relegated to the same academic obscurity as sociology or involved in party politics, for its recommendations will often run contrary to individual freedom. Let us hope that the new institution will not be another body crying in the wilderness, but will be a real source of inspiration to the public conscience.—I am, etc.,

King's College, London. R. J. S. MCDOWALL.

Trichlorethylene as a General Anaesthetic

SIR,—I was interested in the letter by Drs. K. G. Lloyd-Williams and D. Hewspear (Aug. 8, p. 170) describing temporary auricular fibrillation in a patient undergoing partial thyroidectomy under trichlorethylene anaesthesia. It is, of course, possible that the fibrillation was due to trichlorethylene, although up to the present electrocardiograms have shown that arrhythmias under this anaesthetic are usually caused by either auricular or ventricular extrasystoles. There are, however, two other factors in this particular case which seem to me more likely to have caused the condition.

In the first place, the arrhythmia was first noticed "*immediately after intubation.*" Temporary arrhythmias quite commonly follow intubation, and this is one of the reasons why I abandoned endotracheal anaesthesia as a routine for unobstructed goitre operations. A considerable amount of work has been done on this subject, and it has been shown (Reid, L. C., and Brace, D. E., *Surg. Gynec. Obstet.*, 1940, **70**, 157) that arrhythmias are most likely to occur if intubation is performed under light anaesthesia and if the premedication includes morphine or one of its derivatives. The condition appears to be reflex in origin.

The second factor is adrenaline, which was used in the high concentration of 1 in 150,000. For many years I was accustomed to infiltrations of 0.5% novocain and 1 in 250,000 adrenaline, although tachycardia and arrhythmias followed fairly frequently. On one occasion fatal primary cardiac failure, probably ventricular fibrillation, occurred immediately after infiltration. I then tried reducing the adrenaline concentration, but found that the vasoconstriction became unsatisfactory.

Eventually, after a latent period of nearly 20 years, it slowly dawned on me that if the patient was anaesthetized with nitrous oxide and oxygen, the novocain not only performed no useful function, but was actually a nuisance, in that its vasodilator effect counteracted the adrenaline. On omitting the novocain, the adrenaline can be reduced to 1 in 500,000 in normal saline. If this solution is used for infiltration at least 20 minutes before the surgeon makes his incision, a practically bloodless field results, and I have never seen either tachycardia or arrhythmias result.

From the reasons given above I think it doubtful whether trichlorethylene itself caused fibrillation in this specific case, but at the same time our knowledge of the effects of the drug upon the cardiovascular system in man is far from complete and the publication of any additional data is valuable.—I am, etc.,

St. Albans, Herts. C. LANGTON HEWER.

The Medical Curriculum

SIR,—The writer of the leading article under this heading (Aug. 15, p. 191) makes a number of statements which are at variance with the facts as regards both the final examination and medical education, at any rate in a progressive teaching hospital. If this was simply the expression of an individual opinion it would be of small consequence, but when published as a leading article in your *Journal* it has a different significance. From what the writer says it would seem that he has but slight acquaintance either with the final examinations or with the modern methods of medical education. He speaks of "bizarre cases," which he imagines are hunted up with great difficulty for the purposes of the final examination and then disappear either until the next examination or death claims them.

From an extensive personal experience as an examiner in medicine for the Conjoint Board, the Universities of Oxford and London, and the membership of the Royal College of Physicians, I can say that his statement with regard to the final examinations in medicine is quite erroneous. "Bizarre cases" are not wanted for final clinical examinations, and there is no difficutly whatever under peacetime conditions in finding any number of suitable patients from the ordinary hospital clientele. Under war conditions suitable cases can be found without difficulty in the sector hospitals.

With regard to clinical education, the writer suggests that the methods now in vogue differ hardly at all from the method of "walking the hospitals" as practised, I suppose, some 60 or more years ago. What a travesty of the truth! He speaks of an alternative in "the scientific or physiological approach for which many teachers hanker." Inferentially one must assume that this method is forbidden. But in my experience it is the one at present in vogue in any modern and progressive medical school. Surely, sir, if the teachers hanker for this method all they have to do is to employ it. I do not understand what the "synthetic method" may be, but if, as I suspect, it means spoonfeeding, it is surely to be deprecated. There are few who would not agree that the curriculum needs revision and that the scheme of medical education could be improved, but do not let us discard what is good in the existing order of things simply for the sake of something new and call the result progress. The writer, for instance, seems to think that clinical clerkships are to be deprecated, but surely the investigation of the patient by the student at the bedside is one of the most essential aspects of medical education.

I should like to end on a note of complete agreement with the writer when he says with regard to pre-clinical teaching that it is not clear why so little time is left for the study of the mind. The reason for this, and its cure, lie largely with the anatomists and physiologists. There are signs, however, that they are becoming conscious of the need for a thorough revision of the teaching of their subjects.—I am, etc.,

London, W.1. C. M. HINDS-HOWELL.

SIR,—Referring to your leading article on the medical curriculum (Aug. 15, p. 191), I think that the emphasis laid on the division of the curriculum into pre-clinical and clinical is unfortunate. The division is perhaps convenient in many ways, but it is wholly artificial and educationally unsound. It has done much to obscure for students the importance of scientific methods in medicine by the implication that once the official examinations in anatomy and physiology are passed there must be developed a new outlook and a new technique which comprise the mystical "art" of medicine. It has also set up a barrier against that close co-operation between anatomists, physiologists, and clinicians which is so essential in any sound scheme of medical education. The intelligent study of medicine is based on the application of principles common to anatomy, physiology, pathology, and ancillary subjects. Anatomy and physiology must continue to be taught after a student has begun hospital work, not as applied anatomy or applied physiology (as though the earlier work had no application to medicine), but as a natural continuation of the subjects.

Your article states: "It is also clear that life is too short for the medical student to learn everything from the fundamental or scientific standpoint, and it seems probable that he will have to get his scientific education and background in his pre-clinical years and devote the clinical years to the acquisition of technical skill." If this is accepted there seems to be no need for a "pre-clinical" period; let us revert at once to a complete system of apprenticeship so that more time may be available for the acquisition of these "technical skills" which appear to have no relationship to scientific method.

There can be no satisfactory advance in medical education until the curriculum is reviewed as a whole, and the teaching in different departments is correlated so that the student may see, so far as present-day knowledge will allow, a logical application of fundamental principles in the presentation of clinical work.—I am, etc.,

Faculty of Medicine
The University, Sheffield, 1. G. A. CLARK.

Urethral Instrumentation

SIR,—Both Mr. Clifford Morson (June 20, p. 771) and I (July 4, p. 25) were led by our own observations to deplore the ill results that follow upon inexpert treatment of cases of retention of urine. Mr. Morson proposed as a remedy more efficient training in the operation of passing a catheter, whereas I suggested that, as more than the operation itself was involved in the treatment of these cases, the patient should be regarded as an emergency and admitted to an institution.

Dr. Vincent Norman replied to my suggestion by minimizing the dangers of catheterization in the patient's home, and by stating that practitioners were fully aware of these dangers and accordingly took precautions against them. His arguments about the difficulty of admission to an institution at 3 a.m. do not, I am sure, hold with regard to a perforated peptic ulcer, and, therefore, should not apply to acute retention. I am prepared to admit that many institutions do not welcome these cases, and the fault lies often with the surgical staff; but then I am not out to attack practitioners but to find the best method of treatment of these patients. I am not a one-specialty man, and the remainder of his letter is thus irrelevant.

I could quote a number of cases illustrating how justified I was in my complaint, but will, for space reasons, cite the most significant one. A patient two years previously had had retention relieved by catheterization; his relief was great and his gratitude very real; he was not encouraged to have an operation. I saw him recently with chronic retention and a blood urea of 300 mg.%. He was probably a fit, healthy man with little renal damage when he developed retention previously. He was catheterized successfully in every way; in fact so excellent was this treatment that he was afterwards able to pass his water freely. Unfortunately the prostate continued to enlarge, and when admitted he was near to dying from uraemia. I should like to hear some opinions of the percentage of patients with retention who, after catheterization, pass their water freely, and have no more serious trouble beyond the slight prostatic symptoms so commonly met with in elderly men. In my experience a man who has developed retention will almost certainly require further treatment later.

I regard acute retention as almost an absolute indication for operation, in the same way that an attack of appendicitis is an indication for appendicectomy either then or later in a quiescent phase. If this is so, then the sooner operation is performed the better; these patients are getting older, and their kidneys are being progressively damaged. Catheterization then becomes a pre-operative treatment, and the surgeon should be permitted to express his views on how it should be carried

out. In the *Collected Papers of the Mayo Clinic*, 1940, there is a report of 1,000 perurethral operations with a mortality of under 1%. The average age of the patients was 70, and 43 of them were over 80. On these figures Dr. Atkinson will agree that one should not too readily assume that a patient is too old for surgical treatment.

In brief, the ideal procedure should be to transfer the patient as rapidly as possible to hospital after having given a dose of morphine. There he should, after shaving, be catheterized with a rubber or silk web instrument with full aseptic technique, preferably in the theatre; the bladder should be decompressed gradually and then allowed to drain through a tied-in catheter. A house-officer dealing with one or more of these cases every week can be trained by the surgeon to carry out the manœuvre efficiently. In remote parts of the country such a plan may not be possible, and then I would agree that catheterization may become necessary. I would suggest that not more than 1 pint should be withdrawn and admission to an institution then arranged during the following 6 hours.—I am, etc.,

Reading. GORDON L. BOHN.

Jung's Psychology

SIR,—Your sympathetic review of Dr. Jacoby's book *The Psychology of C. G. Jung* makes the following statement: "Jung does not in any way refer theoretical 'structure and function' of the psyche to the structure and function of the body; consequently [!] in some ways his teaching is more of a religion than a science, and is said to have wider application than 'medical healing.'" This, I think, requires comment, because it might well in certain circles damage the reputation of the medical psychologist who uses Jung's method in his work.

In the first place it is not true to say that Jung does not relate mental to physical structure and function. I may quote in this connexion an article published in your *Journal* in, I think, 1938, in which a report of a dream sent to him is quoted giving a diagnosis of organic disease in a particular part of the brain. I may also refer to a similar diagnosis in *Modern Man in Search of a Soul*. Other references will be found in *Contributions to Analytical Psychology*, while one of his followers, Prof. Heyer, has dealt with the gastric neurosis in his book *Organism of the Mind*.

It remains true, however, that analytical psychology is firmly based on the psychological standpoint, but there is no reason to think that Jung's work has produced something that is even "in some ways . . . more a religion than a science." Jung is simply a student of human nature, and his work is neither more nor less scientific than that of others who are interested in the same subject. It should be realized that Jung has created not a branch of medical psychology but a new method of studying the unconscious process, and it is only one aspect of his work that is concerned with psychotherapy. This is why analytical psychology has a "wider application than medical healing." He has investigated "normal" as well as "pathological" phenomena. In the course of his researches Jung came across essentially religious phenomena, but he has never gone beyond the strictly scientific standpoint of recording and classifying the phenomena which he has observed. He has no more created a religion than have the anthropologists.

The sort of mistake which is contained in your review may, to a certain extent, be laid at Jung's door, for his writings often presuppose a knowledge which only a few people possess. Conceivably he should be more elementary, but it is really the task of analytical psychologists to fill in the gaps which he leaves.—I am, etc.,

Nottingham. MICHAEL FORDHAM.

Scabies

SIR,—Dr. A. M. H. Gray (Aug. 8, p. 170) comments on the rarity of scrotal dermatitis as a complication of the treatment of scabies by benzyl benzoate. Approximately 8,845 persons have received this treatment at the Birmingham Public Health Department's scabies treatment centres during the past 18 months (6,413 by the spirit soap lotion and the rest by the *National War Formulary* emulsion). One case of scrotal dermatitis has been reported, and in this case the patient had followed up his benzyl benzoate treatment with a couple of hot strong lysol baths. The interest of this case lies in the fact that, had I not been able to see the patient personally and so learn the whole story, the dermatitis must necessarily have been attributed to the benzyl benzoate.

Dr. Gray mentions that the treatment cannot be carried out by the patient himself. This is often said; I wonder why. Surely there is one, and only one, essential requirement—that the emulsion should be applied to every part of the patient's skin (face and scalp excepted, of course). I should have thought that an intelligent patient, anxious to be cured, was perfectly capable of doing this. In fact it seems likely that the patient might be more thorough in the treatment of, say, his genitals (an important site of infection in the male patient) than would a trained attendant. I am not advocating self-treatment as a routine; my point is that success in treatment is proportional to the care with which the benzyl benzoate is applied, whether by attendant or by patient, and accordingly it is a method well suited to use by the intelligent patient in his own home under medical guidance.—I am, etc.,

Birmingham. L. J. BACON.

SIR,—Your leading article (July 11, p. 44) should help to rouse the medical profession to attack the problem of scabies with a greater measure of success. For 250 years we have sheltered behind impressions and beliefs rather than facts. Surely this is why you find it "remarkable that scabies should be so difficult to control." We are often unable to trace the source of an infection; we are not sure of the length of the latent period before symptoms occur; we may be unable to confirm our diagnosis; and we cannot be certain that viable mites do not remain after treatment.

You rightly draw attention to the carrier or latent case who harbours live mites without rash or irritation. I do not, however, consider such persons alone to be insensitive to the parasite, as experiments with live mites burrowing and crawling on the skin lead me to seek some cause for the irritation other than the progress of the mites through the skin.

You refer to the need for suspecting vesicles near the hands or feet. For 6 months I examined the contents of vesicles in vain, until it was explained to me that the burrow, however short, lay in the cuticle superficial to the vesicle, and that the vesicle was deep to the entrance rather than to the active blind end of the longer burrows. There is evidence that this confusion between burrows and vesicles often leads to disappointing results in the search for the acarus and to errors in diagnosis in atypical cases.

Dr. Kenneth Mellanby, Major C. G. Johnson, and Mr. W. C. Bartley (July 4, p. 1) find that benzyl benzoate lotion with soft soap and spirit is effective in the treatment of scabies, but you mention this as the only sarcopticide to be compared with sulphur ointment. The dermatitis sometimes caused by this lotion does not occur when benzyl benzoate is employed as an aqueous emulsion with wax, or as a simple solution in spirit.

I agree that an increased accuracy of diagnosis is essential, though I believe that such an advance will only follow a keener interest in and search for the parasite. I admit that in the Army our diagnosis may not always be above reproach, but I am not a little disappointed when, after confirming the diagnosis in a soldier, I find that his small child has been attending the local clinic for the past three months with a "teething rash," and that his wife has irritating spots on her wrists and fingers which her doctor attributes to the new national flour.—I am, etc.,

H. F. LUNN,
Captain, R.A.M.C.

Tietze's Disease

SIR,—Following the article on Tietze's disease by Drs. A. Morton Gill, R. Arden Jones, and L. Pollak (Aug. 8, p. 155) the following case may be of interest. In this instance the pain and swelling of the cartilages appear directly to have preceded an attack of pleurisy.

The patient, a labourer aged 35, was admitted to Guy's Hospital on July 5, 1942, complaining that 10 days previously he started getting pain over the right side of the sternum together with dyspnoea and inability to bring up sputum. He went to bed and 2 days later noticed a swelling developing just to the right of the sternum. On the 4th day he began to get pain in the left axilla over the 7th and 8th ribs. This second pain was pleuritic in nature. A few days after admission a doubtful rub was heard in the left

axilla. Previous illnesses: chronic bronchitis many years; about 3 attacks of asthma each winter. No family history of tuberculosis.

On July 23 he was transferred to a war hospital. He is still somewhat short of breath, but the pleurisy has subsided. He complains of an aching pain on the right of the sternum which is made much worse by deep breathing. He is a lean man with sallow complexion; intelligent; all finger-nails are nibbled to the moons. Blood pressure 130/90. Mouth, some pyorrhoea. Chest movement, largely up and down. Poor air entry with scattered low-pitched rhonchi. Very tender over the right 4th, 5th, and 6th costal cartilages, which are slightly swollen and the interspaces almost obliterated. The swellings feel hard and are discrete from the skin. Springing of the ribs causes sharp pain over the affected area. Other systems normal. Blood sedimentation rate 9 mm. in first hour. Kahn reaction negative. *X*-ray examination of chest showed increased fibrosis with large roots and fibrosis at the right apex. Sputum: no tubercle bacilli seen on direct smear. Radiograph of costal cartilages: no abnormality noted.

The patient still has constant aching pain over the right side of the sternum (Aug. 10, 1942) which is less severe than formerly and the area is no longer tender. The swellings are, however, no smaller than on admission

I am indebted to Dr. Hale White for permission to report this case.

—I am, etc.,

P. R. C. EVANS.

Hyperostosis Frontalis Interna

SIR,—I hope that I am not being unduly dense and becoming mixed up in my nomenclature, but does not Dr. C. T. Andrews, in his article on hyperostosis frontalis interna (Aug. 15, p. 185), mean to write "lowered" rather than "raised" glucose tolerance? His patient had a fasting blood sugar of 150 mg. per 100 c.cm., high blood sugar values for the next two and a half hours, and glycosuria on 3 days out of 4. She had also been previously diagnosed as diabetic, presumably after the discovery of a lowered sugar tolerance curve.

Russell Brain (1935, "Glycosuria in Cerebral Lesions," read before the Society of British Neurological Surgery; unpublished) points out that hypothalamic lesions may give glycosuria with or without hyperglycaemia. Hypopituitarism, on the other hand, is said to give a raised sugar tolerance. If we are to assume that the symptoms in Dr. Andrews's case are due to hypothalamic damage, then I, personally, should expect to find glycosuria with or without hyperglycaemia and a lowered sugar tolerance. If I am being dense I apologize, but I should be grateful if the point can be cleared up.—I am, etc.,

Caterham, Surrey. J. MACKAY CRAWFORD.

Enteritis associated with Giardia lamblia

SIR,—The article by Drs. G. Ormiston and Joan Taylor and Prof. G. S. Wilson on enteritis associated with *Giardia lamblia* (Aug. 8, p. 151) will, I trust, be remembered when dealing with enteritis of apparent unknown cause. I have had some experience of this parasite when in the Middle East, and believe it to be commoner than many realize; it is possibly the cause of outbreaks of unexplained enteritis, particularly in institutions and where there is apt to be overcrowding.

I would like to mention a few points in connexion with *Giardia lamblia* which were not brought out in the article and which may help in investigating cases. (1) *Giardia* are found in cats, mice, rats, and some human beings are possibly carriers. They are usually found in the upper part of the small intestine, in the gall-bladder, and in the biliary system. (2) The best way to isolate the protozoon is by means of duodenal drainage through the standard Ryle's tube. This enables the parasite to be seen free from lower intestinal contamination. By injecting a small quantity of magnesium sulphate through the tube the gall-bladder can be drained. The yellow colour of the bile acts as a good contrast background to the parasite. (3) Apart from acute intermittent and chronic enteritis, cases of acute cholecystitis have been reported from time to time which have been due to *Giardia lamblia*. (4) I have known 3 cases of acute catarrhal jaundice to be associated with heavy infection by *Giardia lamblia*. Two of these cleared up quickly with the treatment and disappearance of the parasite. The third proved fatal, and microscopical examination of the liver showed a heavy infection of the biliary system with protozoon.

In view of present wartime conditions, when there is an unfortunate overcrowding both in and out of the Services, with, in some instances, faulty sanitary conditions, an increase in the number of natural hosts, and a possible increase in the dissemination of the parasite, I would like to congratulate the authors on reminding us in their interesting article of the existence of this parasite.—I am, etc.,

Bromsgrove. J. A. SMITH.

Treatment of Malaria

SIR,—I have read with great interest Prof. Warrington Yorke's article on the diagnosis and treatment of malaria in England (July 18, p. 61) and Dr. E. S. Fennell's suggested intravenous method (Aug. 8, p. 171). Having worked on malaria for a number of years in the Tropics, sometimes in hyperendemic areas, and having experience of the disease in its worst forms, may I take the liberty of making a few comments on its diagnosis and treatment?

There is one algid type of malaria which Prof. Yorke has overlooked and which I have quite frequently encountered during an epidemic—the "allergic type." The symptoms in this type are severe headache, vomiting, diarrhoea (sometimes containing blood), subnormal body temperature with a high rectal temperature, and general urticaria. Blood smears showed multiple infections of R.B.C. with malignant tertian rings. Quinine per os was out of the question, so I decided to give it intravenously. I am herewith giving a résumé of my article published in the *Indian Medical Gazette*, 1926, on "Intravenous Use of Quinine, Arsenic, and Adrenaline in Algid Cases of Malaria." I have given a total of about 3,000 to 4,000 injections without a fatal case.

Technique.—Quinine, specific for malaria; arsenic, a haematinic and general tonic in small doses; adrenaline counteracts fall of blood pressure due to quinine and "quinism." 10 grains of quinine bihydrochloride is dissolved in 20 c.cm. of redistilled water in a test-tube, to which is added 3 drops of liq. arsenii hydrochlor. The tube is then heated over a spirit lamp until the quinine is completely dissolved. Allow the sol to cool to about body temperature, draw up 10 minims of a fresh sol of liq. adrenalin. hydrochlor. into the syringe containing the quinine sol and inject, preferably into the median basilic vein at the bend of the elbow.

Do not heat the adrenaline, as it decomposes on heating and will not have the desired effect. The injection must be made very slowly, at least 7 to 10 minutes. If too rapid an injection is made it might cause acute dilatation of the heart and syncope. The rate can be judged by the patient's respiration. If the injection is made too fast the patient will complain of a tight feeling in the chest and his respiration will get hurried. I found the best time to give the injection was when the patient commenced a rigor, as the sporozoites at this stage are free in the general circulation, and this offers an opportune moment to destroy them. My results have been verified by blood examination before and after injection, by which I found that if an injection is given at this stage there is a marked reduction of the parasites. The following mixture was given when the patient was able to swallow:

℞ Quinin. sulph.	gr. x
Acid. citric.	gr. x
Tr. nuc. vom.	♏x
Liq. arsenicalis	♏iij
Aq. syrup. limon.	ʒj
Aq.	ad ʒss

ʒss t.d.s. for 10 days.

A diet which favours blood regeneration should be given, such as red meat, green vegetables, fruit (vitamin C), plenty of fluid with glucose if vomiting is persistent. The anaemia following malaria is of a microcytic type, as with most protozoal infections, and iron is indicated.

The synthetic compound of atebrin could be used instead of quinine, as advised by Prof. Warrington Yorke, after the acute stage has subsided.

—I am, etc.,

Whitchurch, Cardiff. SYDNEY J. BELLGARD.

SIR,—I was interested in the report of a meeting of the Royal Society of Tropical Medicine (Aug. 8, p. 167) at which the treatment of malaria was discussed. I agree with Prof. Warrington Yorke that the conservation of the present limited supply of quinine must be effected by rigid economy in the large amount used for prophylactic treatment. I admit to some bias, as I have never believed in the efficacy of the daily 5 grains as a prophylactic. About 40 years ago in India and Burma I treated severe cases of malaria by intramuscular injection of quinine bihydrochloride, and never saw the slightest

ill effect from it. On the contrary, I am convinced that it saved lives.

In 1906, when serving in "the bush," Sierra Leone Protectorate, I contracted malignant tertian malaria confirmed by myself by microscope. As no other doctor was available I treated myself by intramuscular injections of quinine bihydrochloride. Except for a mild recurrence, also treated by injection (single), ? two months later, I have never suffered from malaria since. I am therefore in full accord with Prof. Yorke in expressing "surprise and consternation" at Sir R. Christophers's denunciation of the intramuscular use of quinine.—I am, etc.,

Bath. J. COWAN, M.B.
Lieut.-Col., R.A.M.C. (ret.).

Treatment of Threadworms

SIR,—Prof. James Miller has pointed out to me Dr. C. Paget Lapage's letter (June 13, p. 738) on the treatment of threadworms, in which he advocates the use of barium. It is our experience that any mode of treatment for pinworm infections which depends on its mechanical effect alone is at best purely palliative. And while a number of worms may be dislodged by the use of barium, a few are bound to escape and will serve as the nucleus from which a new autoinfection is quickly built up.

Recent investigations have made available two drugs which are specific in the treatment of pinworms—gentian violet and phenothiazine. Gentian violet is administered in coated tablets, either enteric-coated or with a water-soluble coating of an adjusted thickness which disintegrates at a specified time after ingestion. The coated tablets are given to ensure their reaching well down the intestine before they disintegrate, thus providing a maximum concentration of the drug at the site of infection. Our tests with gentian violet in the treatment of pinworm infections in children of school age have shown it to be effective in 60 to 90% of those treated (Miller *et al., Canad. med. Ass. J.*, 194, **43,** 455). The following doses are recommended: Children under 10 years, 1/4 grain 3 times a day before meals for 10 days; children from 10 to 13 years, 1/2 grain 3 times a day before meals for 10 days; children over 13 years and adults, 1 grain 3 times a day before meals for 10 days. These dosages are not rigidly fixed, and if a child is big for its age or is small and puny the dose is determined accordingly. We found that untoward symptoms were almost entirely avoided if the drug was given in 2 five-day periods separated by a treatment-free period of one day.

Phenothiazine administered in chocolate tablets is even more efficient than gentian violet in the treatment of pinworm infections (Miller and Allan, *Canad. med. Ass. J.*, 1942, **46,** 111). However, because of its haemolytic action and other toxic effects, we agree with Dr. Lapage that its use should be avoided until more is known of its action on the body.—I am, etc.,

Institute of Parasitology, Macdonald College, McGill University, Quebec. MAX J. MILLER.

The Blood in Cancer

SIR,—The blood may be studied from so many aspects that research on its appearances in cancer should be restricted to certain specified lines. Dr. O. C. Gruner seems to attempt too much in his book reviewed in the *Journal* of Aug. 8 (p. 159), for the results of his many years of study seem more a maze with many blind alleys than a path to follow hopefully. His book claims to offer the surgeon and the radiotherapist just what they want most from some laboratory method: diagnostic confirmation of the presence or absence of cancer; in treated patients the likelihood or not of the completeness of cure; and an indicator of the phase of the periodicity of each case. (The last point Gruner has given in more detail in Fig. 5 in his paper in the *Canad. med. Ass. J.*, 1941, **44,** 256.) But over a year's trial of his methods has shown, to my regret, a value most apparent in the patients with a high grade of tumour activity—i.e., where such additional tests are least needed.

Your reviewer states that Dr. Gruner "does not claim absolute certainty of diagnosis" by his methods, but such a claim would seem to be made on p. 41 for what are called "geniculate" mitochondrial forms in monocytes. These are said to be so pathognomonic "that if one genuine one is seen there is no need to search further to make the diagnosis." Further, as they "indicate active disease" (p. 64) the important conclusion is drawn that "more than half the cases treated by modern methods still show evidences of cancer in the body."

My studies (in progress) show these forms are not "pathognomonic," for similar forms are to be seen in the other leucocytes and in lymphocytes (more so in leukaemic blood); they are also to be seen in cancer and normal and non-cancer blood when stained (fresh blood) with Duboscq's solution or (dried films) with Victoria blue or with Morosow's silver method, and examined with a low condenser and good light (and binocular); they are also to be seen in many haematoxylin-stained tumour and normal cells; and (in very fine types) in viruses, as vaccinia, herpes, and molluscum contagiosum. These zig-zag noded forms of cell-reticulum or mitochondria need much further research.—I am, etc.,

London, W.1. J. H. DOUGLAS WEBSTER.

Meningococcal Septicaemia resembling Malaria

SIR,—The case of meningococcal septicaemia resembling malaria reported by Major-Gen. Robert Priest (Aug. 1, p. 129) recalled a similar interesting case under my care last year. In his patient meningococcal septicaemia was apparently diagnosed confidently by Major-Gen. Priest on the occurrence of characteristic cutaneous eruptions, although no organism was isolated. In my patient there were no cutaneous signs, and organisms were finally recovered from the cerebrospinal fluid. The two cases appear complementary in providing a clinical picture of interest.

A boy of 15 was admitted for observation to the local isolation hospital during a small epidemic of paratyphoid B fever. For 6 days previously he had been feverish and confined to bed. Blood taken the day before admission showed agglutination to *B. paratyphosus* B at 1/30. On admission he was comfortable, afebrile, and no clinical abnormality could be discovered. Blood culture was sterile; examination of urine and faeces and subsequent Widal tests ruled out the possibility of paratyphoid fever. On the evening of the second day after admission he had a rigor with headache, vomiting, generalized pains, and temperature of 103.6° F. Eight hours later the temperature was normal. Three further similar attacks developed with a quartan rhythm as in Major-Gen. Priest's case. No cutaneous eruption developed. Several blood films revealed no malaria parasites, but a course of quinine bihydrochloride was given, and the next rise in temperature did not occur as expected, but recurred after four afebrile days when the patient was still receiving quinine. Owing to pressure on the accommodation and the necessity to admit patients requiring urgent treatment, he was transferred the next day for further investigation to the local general infirmary. Investigations there revealed no abnormality, and his temperature remained normal until his discharge a fortnight later.

Three weeks after discharge he was readmitted to the local isolation hospital suffering from severe headache and generalized pains of 3 days' duration. The diagnosis of meningococcal meningitis was confirmed by culture of the turbid cerebrospinal fluid. No rash was present. Treatment with sulphapyridine resulted in a rapid uncomplicated recovery. He stated that he had not really felt well after discharge from the infirmary.—I am, etc.,

Southport. F. E. CRAWLEY.

"Removal for Mental Observation"

SIR,—The article by Dr. Arthur Harris (Aug. 1, p. 136) is a timely contribution. It reveals a deficiency for which the general practitioner is not wholly responsible. Unfortunately Dr. Harris's remarks are too condensed to be of much practical value, and make little attempt at any substantial solution of the problem.

The average general practitioner has little time or opportunity to devote to the mental assessment factor. Academically he is usually poorly equipped for the purpose. What proficiency he may acquire has to be gained in the hard school of cumulative experience. Lately he has been granted the privilege of postgraduate study, but, in this, too little time has been allotted to the ever-growing importance of the abnormal mental state.

The general practitioner need not be too despondent about his mistakes. The senior specialist is still a long way from the

acme of infallibility, which fact, no doubt, many of your readers have reason to deprecate.

Dr. Harris suggests that misdirected disposal may lead to public censure and may jeopardize prestige. Undoubtedly this is true, but is it not sometimes the outcome of diplomatic indiscretion on the part of an officious colleague?

Dr. Harris states also that all mental cases of "organic" origin should be lodged in a general hospital. The satisfactory operation of this policy would challenge even the ability of its author. At the present time I cannot visualize the general hospital that would accept without controversy any case with a dominant mental picture. The policy, however, does merit consideration. Would it not be practicable to institute an observation department in our general hospitals? If so, futile travel might be partly eliminated, patient and relative would probably be more co-operative, fuller investigation would be facilitated, and, incidentally, any anxiety on the part of the practitioner with regard to reputation would be appreciably relieved.

Too often has the general practitioner to sacrifice incentive and ability at the altar of inefficient and clumsy administration.—I am, etc.,

Birmingham. A. W. DOCKAR.

SIR,—I was interested to read Dr. Arthur Harris's article (Aug. 1, p. 136). He deals very thoroughly with the organic diseases that simulate acute psychoses by the presenting symptoms and signs of confusion and delirium, and the only additions I should like to make are cerebral contusion, hypoglycaemic states, and subarachnoid haemorrhage. I cannot, however, agree with his view that the majority of these conditions should not be admitted to the mental observation ward. These cases are unsuitable for home nursing and a source of worry, discomfort, and apprehension to other patients in the general wards. Moreover, in my experience, since the presenting symptomatology is one of mental abnormality and behaviour disorder there is little difficulty in explaining to relatives that in fact the observation ward is the ideal place for these patients, although their primary illness is physical.

The real pitfall in the management of these cases is their admission to a mental hospital under certificate, which can only be avoided by staffing the observation ward with efficient nurses and well-qualified doctors of sufficient experience to make a correct diagnosis. Under these conditions the observation ward forms an important part of the neuropsychiatric unit of any general hospital, and without it the hospital is unable to give the fullest service to the public and to the local general practitioners.—I am, etc.,

Central Middlesex Hospital, N.W.10. A. BARHAM CARTER.

A Depression–Hyposexual–Alopecia Syndrome

SIR,—I am grateful to Dr. Ucko (Aug. 8, p. 174) for his kind interest in our paper and agree with him that further investigations would have been helpful. They were omitted only because the case was actually under my care for a short time, and the patient was already being boarded-out when I first saw him. Moreover, perhaps Dr. Ucko does not realize that research in the hurly-burly of a war hospital is somewhat different from doing similar work comfortably in the West End. We pointed out the similarity of the condition we described to some aspects of Simmonds's disease, but we cannot accept that it is merely an undeveloped form of this illness. Simmonds's disease is characterized by emaciation, anorexia, asthenia, precocious ageing, breaking of the nails, hypotension, etc. None of these conditions was found to be present. Again, myxoedema shows swelling of the subcutaneous tissue, puffiness of the face, changes in skin coloration and texture, vocalization, gait, mentation, reaction to cold, etc. These were entirely absent. It does not appear to me that the malady which we have described is a variety of either hypothyroidism, however masked, or of Simmonds's disease, and had Dr. Ucko seen the patient I am sure that he would have agreed. Nevertheless, I hope that I shall have the good fortune to encounter further cases which will be under my care for a longer period, and I shall be able to repay Dr. Ucko's kind interest by conclusive proof that this is a new endocrine and psychiatric syndrome.—I am, etc.,

CLIFFORD ALLEN.

Body Mechanics

SIR,—A review in your issue of July 25 (p. 99) of *Body Mechanics in Health and Disease* by Goldthwait and others called forth a comment from Dr. George Macdonald (Aug. 8, p. 173) that the theories advanced in the book in question are similar to those propounded by Still, the original osteopath, 80 years ago. I must point out that long before this the theories had been propounded by the Swede P. H. Ling (1776–1839), on which he based his educational gymnastics for the acquisition and maintenance of health and his medical gymnastics for the alleviation and cure of diseased conditions.

It is unfortunate that osteopaths should so often arrogate to themselves "discoveries" to which they are not entitled. I may, for instance, mention that an article of mine, written in conjunction with Dr. Kellgren-Cyriax, on the manual treatment of the abdominal sympathetic (*N.Y. med. J.*, 1910, **7**, 193) was severely criticized by Smith in the *Lancet-Clinic* for 1911, who accused us of borrowing methods from the osteopaths and exploiting them as new. To this we replied in the former journal (1912, **95**, 897) by quoting a large number of authors of the Swedish school who had written about this method of treatment for many decades before the time of Still. Another example is to be found in the pretensions of osteopaths that it was they who discovered that vertebrae could be replaced by manipulation, and that this was a valuable measure in the treatment of spinal curvatures and various nervous troubles. They entirely ignore the fact that these methods were extensively practised by Dr. E. Harrison during the early part of last century, as can be seen from his papers on the subject in the *London Physical and Medical Journal* for 1820, the *Gazette of Practical Medicine*, and a number of larger works.—I am, etc.,

London, W.1. EDGAR CYRIAX, M.D.

Atypical Asphyxial Deaths

SIR,—I was interested in the short article on atypical asphyxial deaths by Dr. Norman Patterson (Aug. 15, p. 188). It is strange that three cases of distension of the pharynx with bread should have occurred in so short a time in the experience of one medical officer. This could obviously only happen in a mental hospital and in patients with a deranged mind.

Some ten years ago I was engaged in research on the lymphatic drainage through the oesophagus, and had as my subjects a series of monkeys on whom I passed an oesophagoscope. Naturally these tubes, being constructed for the human gullet, were over-sized for the monkeys and considerable anxiety was caused. Each time they passed the larynx and trachea the heart always stopped beating, even although the larynx had been anaesthetized with cocaine, and one monkey actually died under the operation. There can be little question that it was the pressure which caused the vagal inhibition of the heart, and I imagine that the cases described were of this nature rather than a true asphyxia.—I am, etc.,

Birmingham. MUSGRAVE WOODMAN.

Anaesthetic Death in the Surgery

SIR,—I would suggest to Dr. A. H. Bartley (Aug. 8, p. 170) that the dilemma he was involved in was due to an "error" in anaesthesia and would have occurred most probably in hospital also, given the same set of circumstances. Speaking as an anaesthetist, I strongly advise him to avoid chloroform or "ether–chloroform mixture" at all costs in cases of fracture and dislocation, as such patients are unusually prone to collapse under chloroform anaesthesia. It is also well known that shock is an absolute or relative contraindication to chloroform. I regard ether–chloroform mixture as essentially chloroform in action, and administer it with the same amount of caution as if it were pure chloroform, and only in those conditions for which a satisfactory reason for the choice of chloroform can be substantiated.

Though hospital is undoubtedly the better place for such a procedure, the risk of removal may be much greater than the relative advantage to be gained. For such a problem (increased in number many times by "blitzes") I have adopted, and intend to continue to adopt, either open ethyl chloride–ether sequence or gas-and-oxygen–ether sequence. Of the choice of two evils—"chloroform collapse" or risk of "post-operative pulmonary complications" (which, by the way, have occurred

irrespective of the type of anaesthesia)—I prefer the latter. I have, I may add, witnessed both conditions.

If Dr. Bartley adopts this technique I feel sure he will not get another "nightmare," and should the worst occur this choice of anaesthetic will weigh much more in his favour than that of chloroform. The attendance of a colleague, wherever possible, is a *sine qua non*.—I am, etc.,

Bradford. P. ESMONDE WOODROOFE.

SIR,—The case described by Dr. A. H. Bartley is reminiscent of one of Guedel's illustrative cases in the chapter on ventricular fibrillation in his *Inhalation Anaesthesia* (New York, 1938).

Dr. Bartley says he reduced the fracture when the child was apparently under. One might infer from this that she was not necessarily really and truly sufficiently anaesthetized. Should this surmise be correct, and realizing the possible combined effect of pain, fear, and a chloroform mixture, "the stage would be well set for ventricular fibrillation" and, to continue the quotation from Guedel, the operation "provided the required added stimulus to produce the fibrillation. The fibrillation passed before anoxic depression rendered the heart unresponsive to its normal stimulus. It is doubtful whether the violent resuscitative measures influenced the outcome. Possibly the fibrillation passed in spite of the traumatic stimulation of the precordial massage."

My opinion is that the risk of inviting anaesthetic death in the surgery far outweighed the risk of added shock due to a journey of 7 miles to hospital. A further alternative was to secure the help of an anaesthetist.—I am, etc.,

Salisbury. A. D. H. SIMPSON.

Sterilizing Sulphonamide Powders

SIR,—In connexion with the sterilization of sulphanilamide, may I, as a hospital pharmacist, be allowed to make a contribution to the *Journal*.

I have read with interest Mr. J. C. Cherry's letter (Aug. 1, p. 142) on the sterilization of dry powders and his method of sterilizing sulphanilamide. Messrs. May and Baker referred to the changes in colour which take place when sulphanilamide, sulphapyridine, and sulphathiazole are subjected to dry-heat temperature high enough to sterilize them (*Prevention and Treatment of Infection in Wounds by Sulphonamides*, March, 1941) and, as reported, the method probably turns the powders toxic. The only alternative method, therefore, is sterilization by moist heat.

I should like to comment upon one of Mr. Cherry's statements. He says, referring to his sterile powder: "The powder in the beaker may be slightly caked, and may need to be pounded a little with a glass rod." I think it is almost certain to be caked if a very necessary detail, omitted from Mr. Cherry's method, is not observed. Using a very similar method, I had, during my investigations into this problem, six out of six batches cake. If it is desired to make sulphanilamide cake or crystallize, the sure method is to allow moisture other than steam to get at it. Even if the powder is not moistened (as described in the last paragraph of Mr. Cherry's letter), water will still get at the powder and cause caking or crystallization. There seem to be two possible reasons for this, and I believe that one or both may be responsible for the difficulty. They are as follows and probably occur in this order.

1. When steam is turned on to the cold flask or other container and the cold powder, condensation takes place, water is formed, is heated during sterilization, dissolves the sulphanilamide, evaporates again as the powder gets hot, and leaves behind the powder it has dissolved in a crystalline form, usually as a solid cake. This should occur fairly early in the sterilization process. If it does, and if a fairly dense mass of powder is being sterilized—e.g., 15 grammes in a narrow container—steam may not have penetrated to the bottom of the mass before caking occurs. How is steam to penetrate the hard surface cake formed and sterilize the powder at the bottom or the centre?

2. Where a not too dense mass of powder is used (as in the case of 15 grammes distributed over the bottom of a flask, a relatively large area), steam gets at the centre of the powder before caking occurs, condenses, and cakes the core as well as the surface. Even if the core did not cake during sterilization, it would later when the powder mass cooled, because the steam in the centre would condense. It could not escape during the vacuum drying because of the hard outer cake. I am working to confirm these theories, but have proved that condensation of steam and formation of water are responsible for caking in methods where the dry powder is autoclaved.

If the powder can be sterilized in its final container, it is better than having to transfer sterile powder from one container to another, and there is then no need for sterile gloves, mask, and gown. I wish to describe a method of autoclaving sulphanilamide in its final container, whereby the sterilized preparation is available as a soft white powder suitable for insufflation. I completed my method early in July, and have since then done several test sterilizations of sulphanilamide, and in every case have produced a smooth white powder. In two different experiments the powder was deliberately contaminated, one with *Staph. aureus*, the other with *B. welchii*. Both powders were found to be sterile after autoclaving by my method as follows.

An autoclave with vacuum drying attachment (dressing sterilizer) was used and the container was a dry boiling-tube plugged with non-absorbent wool. The boiling-tube must be thoroughly dried, if possible in a hot-air oven. (1) The jacket pressure of the sterilizer should be ready at a pressure of 20 to 30 lb. (2) Allow steam at 20 lb. into the empty closed chamber of the autoclave and leave for five minutes. (3) Using the appropriate valves clear chamber of all steam and condensed water. This process has heated the chamber, and the boiling-tubes, loosely plugged with non-absorbent wool and containing the powder (in 5- or 10-gramme batches), are now placed in it. They should be placed on their sides, with the powder spread over their full length, giving a thinner mass for the steam to penetrate. (4) Leave the tubes for 15 minutes in the hot chamber; this heats tubes and contents sufficiently to prevent condensation inside and on the powder. (5) Autoclave at 15 lb. for half an hour. (6) Clear the chamber of steam and any condensed water quickly, and allow vacuum of 10 to 15 inches for 15 minutes. (7) Remove tubes from autoclave, place a tight sterile plug of non-absorbent wool on the top of the one already in, and cap tubes with a suitable paper—preferably cellophane. Caking does not occur. If apparent caking is observed, it is only present while the powder is still hot, and when cool a tap on the side of the tube is all that is necessary to show the sterile preparation to be the desired soft powder.

Thanks are due to Dr. Rosher, director, pathological laboratories, Mile End Hospital, where examination of the powder when contaminated and after sterilization was carried out, and to his assistants Mr. Crawley and Miss Brews; also to Mr. J. Leebody, medical superintendent of this hospital, for permission to carry out the work, and the medical officer of health, London County Council, for permission to publish.
—I am, etc.,

St. George-in-the-East Hospital, E.1. W. J. BUCKLAND, Pharmacist.

Complacency in Anaesthetics?

SIR,—The letter from Dr. A Mills (Aug. 8, p. 169) is so good that it seems to me important that where it contains doctrine which cannot be accepted by anaesthetists of experience equal in both giving anaesthetics and teaching to that of Dr. Mills this should be pointed out. Otherwise if passed unchallenged these fallacious statements might be accepted as correct by the comparatively inexperienced. Where I join issue with Dr. Mills is in (1) his implied condemnation of intravenous methods and (2) his contention that gas–oxygen–ether from a machine is not efficient for the deepest anaesthesia. Incidentally I may say that, like Dr. Mills, I have not seen a case of ether convulsion, but I do not attribute the cause of these to machines, because I know of many instances in which the convulsions have occurred when no machine was used.

Now as regards (1) Dr. Mills's words are: "a drug can be introduced directly into the circulation to produce an *uncontrollable* state of coma, but this procedure does not appear to be a desirable one." This presumably rules out such methods as the use of pentothal intravenously. Dr. Mills's objection seems to me of theoretical value only. In practice it does not matter that the dose injected is uncontrollable because, guided

by the knowledge gained through experiment and wide clinical practice, the anaesthetist puts in only so much of his anaesthetic drug as is certainly safe. This he does by injecting slowly, being guided by the symptoms evoked and by knowledge of the general limits of safety to which I have alluded. He has no need to control the dose after it is in the patient's body.

As regards (2), if it were true that satisfactory anaesthesia, say for upper abdominal operations, were not obtainable by gas–oxygen–ether, surely we should have heard of it from surgeons in no measured terms ere now. "The proof of the pudding is in the eating," and there are hundreds of surgeons working contentedly every day with an anaesthesia provided by gas–oxygen–ether from a machine. One of the chief advantages of the method is the very thing for which Dr. Mills so rightly pleads—a copious supply of oxygen. This can be achieved more surely from the oxygen cylinder than from the air drawn through an ether-soaked mask. Needless to say, proper premedication and perfectly unobstructed breathing are essential. The latter is often secured by an airway, but if necessary an endotracheal tube is used. Through these measures perfect relaxation in patients free from cyanosis and abundantly supplied with oxygen is provided daily by scores of anaesthetists. Moreover, the condition of patients after a long operation, if they have been handled in this way, is much better than that of patients who have been deeply under pure ether throughout. The machine enables us to take advantage of those periods, often considerable, when the deepest anaesthesia is not needed; at those times the patient gets gas and oxygen only. Like Dr. Mills I regard giving anaesthetics as an art, and believe that no one method should be laid down as the sole routine. Therefore I am far from disparaging open ether, and hold indeed that no student should be allowed to qualify without competence in its use.—I am, etc.,

West Middlesex County Hospital. J. BLOMFIELD.

Operations and Workmen's Compensation

SIR,—I feel that Dr. Hermann Levy's letter (July 18, p. 82) and Dr. W. O. Moore Ede's subsequent one (Aug. 1, p. 142) call for some comment.

Dr. Levy's letter in particular raises points and asks questions which, though most of the latter are rhetorical, show a misunderstanding of the Workmen's Compensation Act and, if I may say so, a biased outlook. To deal with his letter in detail.

1. What does Dr. Levy mean by "getting him back *at any price* to some sort of light work"? Surely it is in the interests of both employer and workman that the injured man should find suitable occupation as soon as possible. His financial position is thereby improved and his mind is occupied, minimizing the dangers of worry and introspection.

2. No responsible examiner acting for employers would ever suggest any operation "for . . . evil."

3. It has been my experience during many years of examining accident cases that occasions for difference of opinion with general practitioners are very rare. In any event to call a genuine difference of opinion a dispute and an employer's medical examiner an opponent betrays an attitude of mind that, if held by a workman's doctor, would go a long way to explain the patient's "very unfavourable attitude" to workmen's compensation law.

In answer to questions raised by Dr. Levy. Whether the effect of an operation is of lasting value does not bear on the question of compensation, because under the Act, if by reason of the effects of the accident or treatment for it the man's working capacity deteriorates at any time, he is entitled to receive again the appropriate weekly compensations. The question of the finding of appropriate light work is dealt with in the Act, which provides that if the workman can show that in spite of reasonable efforts he has been unable to find such work he shall be deemed to be totally uncapacitated.

The question of a subsequent accident is dealt with under the Act either as a claim *de novo*, or, if it arises as a result of disability due to a previous accident, the increased disability is regarded as the result of the first accident, and the employers responsible for the first accident are liable to pay compensation for the second. With regard to the provision of appliances, it is an almost invariable practice for the insurance company to supply these in the first instance, and in very many cases the estimated cost of replacements is covered by a "lump sum" settlement. It is, however, a weakness of the Act that no definite provision is made for this.

Dr. Moore Ede's suggestion that all cases should be referred to a neutral body—e.g., the Ministry of Pensions—has been tried in Canada with, I believe, some success, but the provision in the Workmen's Compensation Act whereby an independent referee appointed for each county court may be appealed to by either side is so seldom made use of that it is very doubtful if it would be acceptable in England. This matter, however, involves many side issues—legal and otherwise—and cannot be properly dealt with in a letter. The Workmen's Compensation Act has several weak points and I hold no special brief for it, but misconception of its provisions do not assist its amendment.

—I am, etc.,

London, W.1. HAROLD GARDINER.

The Planning Commission's Report

SIR,—I have just read Dr. N. M. Vallely's letter (Aug. 8, p. 168). The point that he and many others seem to miss is just this. State medical service has to come: it is being forced on us by circumstance whether we like it or not. It is a natural result of this war, which is creating scarcities in men and material. The conditions now beginning are, if anything, likely to progress rather than to go back to where we were, and the peace is not likely to restore those conditions to what we considered as normal. Since this is so, why not envisage an *ideal* plan of State medicine, rather than try to compromise between State medicine and our present system, if such it can be called. You may never quite attain an ideal, but at least it is there to work for; but what is the result if you never quite attain a miserable compromise—and, in the end, be very sure that in a compromise the only losers will be the medical profession. We should have a well-laid plan, and we should see that the men who are responsible for its administration are not only administrators but qualified doctors as well.

The men who object to a complete State medical service, which is, as I think, inevitable, do not see that one may compromise with the present Government, but what of the Government after the war? Unless you plan ideally is it not likely that a Labour Government may whittle away that compromise until we are controlled completely? We should begin at once to build a powerful organization based on a solid plan rather than merely modify our present "system," so that when the time comes we shall rule and not be ruled.—I am, etc.,

Ledbury. GEOFFREY G. AIREY.

Self-medication and the Chemist's Shop

SIR,—Dr. E. L. Loewenthal's interesting letter raises points of great importance, but he seems hardly to realize that they have, though with no really appreciable result, been very frequently discussed in public. He should read for this purpose the evidence of the Select Committee on Stamp Duties, 1937, the PEP *Report on the British Health Services*, the debates in the House of Commons last year when the new Pharmacy and Medicines Bill was discussed, and an article on the "Druggist's Dilemma" in the *Economist* of July 12, 1941. Self-medication, if exaggerated, is certainly a deplorable thing. That the English have a certain proneness to it should be taken into account. "I hate doctors but I love medicines," says a titled lady in one of Oscar Wilde's stories. Business men have not been idle in exploiting these leanings, and it is to the credit of the B.M.A. that as long as 30 years ago it called attention to the abuses in its unforgotten publications on *Secret Remedies*.

Nobody will deny, however, that a moderate sort of self-medication is not to be condemned altogether. But that advertisements urging people to take certain patent medicines as all-in cures, that overworked and ill-paid panel doctors with little time for the single case, that overcrowded hospitals and an entirely insufficient N.H.I. scheme drive people of the poorer classes to try their own cures or the druggists' remedies, is, indeed, a tragedy. It is from all these angles that a campaign against self-medication might be started. But once undesirable causes and incentives to unjustified self-medication are removed, it is very doubtful whether further restrictions (Dr. Loewenthal ignores the existing ones) on the sale of so-called drugs and medicines in other than chemists' shops should be imposed by statute. It should not be forgotten that druggists and pharmacists not only form a profession but are also retail traders. In the latter capacity they resent that retail distributors not belonging to their "profession" sell aspirin or stomach powders or peroxide, while they themselves find no harm in selling hot-

water bottles, films, toilet soap, or lavender water. If Dr. Loewenthal's restrictive recommendations were carried out the quasi-monopoly position of the pharmacist as opposed to "other vendors" would be greatly strengthened. No social advantage would result from such development. But improved health services, a more energetic control of patent medicines and their advertisements, and a careful observation by doctors of the recommendations laid down in the *National Formulary* as regards the use of non-proprietary preparations would probably help much in avoiding some of the dangers which Dr. Loewenthal has in mind, and would simultaneously cheapen the cost of treatment.—I am, etc.,

Richmond. HERMANN LEVY.

SIR,—I read Dr. E. L. Loewenthal's admirably expressed letter on self-medication and the chemist's shop (Aug. 15, p. 199) with considerable interest. While agreeing entirely with what he says, I do not think that he has mentioned the most pressing aspect of the matter. The enormous waste of material and labour which results from self-medication is not permissible at the present critical stage of the war. It is essential that we should build up a reserve of drugs for home needs, for the Forces, for the second front, and for the allies—notably China, whose gallant 8th Route Army was stated recently to have received no medical supplies from abroad for many months. To this end it is imperative that the resources of our chemical industry should be fully mobilized for essential purposes only.

In hospitals we are exhorted to use the utmost economy in the use of such things as aspirin and disinfectants, yet the well-meaning housewife may go to the pharmacist's and buy as much dettol as she likes to tip down the w.c. and the aspirin addict may purchase as much aspirin as he pleases. Surely a control over all important drugs such as that recently introduced for quinine is long overdue. They should be obtainable only for hospitals, clinics, or on a medical prescription. Strict control should also be exercised over the allotment of drugs, so that sufficient quantities are available for essential purposes over-seas as well as at home. The production of the many useless and harmful preparations now on the market should be prohibited and the labour and material diverted to necessities. —I am, etc.,

St. Mary Cray, Kent. BRIAN H. KIRMAN.

The Evils of Long Working Hours

SIR,—Your leading article on the evils of long working hours (Aug. 1, p. 132) is a valuable indication of the necessity for a drastic overhaul of our working conditions. May I call your attention to the conditions of another section of the community—the young laboratory assistants of both sexes? They are now chiefly recruited from secondary schools, and matriculation is the standard of general education required.

These young people of 17 or 18 years of age enter their first job enthusiastically in laboratories attached to factories, where they are employed in routine process control from 8 or 8.30 a.m. to 5.30 or 6 p.m. (with 1 hour for lunch and 15 minutes for tea if they are lucky). They have a fortnight's holiday per annum. They are encouraged by their employers to study for university degrees at evening schools, and, being intelligent and keen, they embark on courses of study which absorb an average of 4 evenings a week from 6 p.m. till 8.30 or 9 p.m. Their homework they do at week-ends or on the evenings not occupied with actual classes, but since they rarely have time for even a hurried meal between work and evening school, I have never been able to discover when they get the necessary fresh air and exercise for proper physical development.

My experience is with training these young chemists during their working hours, though I have also taught evening classes for some years. I have seen so much good human material ruined by these gruelling conditions. After a few months of this life mental and physical fatigue is apparent in all their actions. In peacetime this is bad enough, but I have seen these young people in an ordnance factory made to work daily from 8.30 a.m. till 5.30 p.m. and on alternate Saturday afternoons till 5 p.m. (instead of the usual 1 p.m.). At rush periods they have worked on Sundays too, without a compensatory day's holiday later in the week. When one has seen these youngsters of the 18 to 23 age group working for 12 consecutive days without a break in the unhealthy atmosphere of a chemical laboratory one appreciates the meaning of industrial fatigue, especially if they are handling high explosives. I know of cases where young women laboratory assistants at various stages of education between matriculation and B.Sc. work consistently for an 8-day rota of these long hours. It makes one wonder whether it is really civilization for which we are fighting, since the old pagan human sacrifice meant only death, whereas this is a refinement of slow murder.

As you so rightly point out, the young men can stand adverse conditions much better without permanent harm and in any case with a man one is dealing with an individual. But these young women, and their counterparts in factory operatives, are the mothers of the future, and it is little short of racial suicide to expose them to such unnatural strains during the difficult years of adjustment between puberty and full womanhood. We have yet to learn the extent of the damage which may be done to them. Surely an enlightened State would legislate so that continuation classes could be counted as part of the day's work and not in addition to it. If certain individuals, whether boys or girls, leave school at 17 and are considered suitable for further training they have a human right to assistance without mortgaging their future health and happiness. Surely this is in the best interests of the State as well as the individual.—I am, etc.,

London, W.4. ENID A. M. BRADFORD.

Ministerial Propaganda

SIR,—I am much interested in the furtherance of immunization against diphtheria and am doing my own little best to that end. While fully agreeing with the necessity for a campaign by the Ministries of Health and Information, I feel that their widely displayed posters might be improved upon by one or two simple alterations to the wording. In this public health department the posters have been altered so that parents are requested to "Ask your own doctor, or inquire at the council offices or at the nearest child welfare or school clinic." I think it regrettable that the private practitioner is not considered in any of the posters I have seen. Nor can I find the family doctor mentioned in the large brochure sent out by the Ministry of Health in conjunction with the Ministry of Information. At the foot of page 7 of this brochure I read: "It is suggested that local authorities should invite the co-operation of all appropriate persons and organizations in propagating the need for immunization." I wonder if the private practitioner is wrapped up in this camouflage, or is he deliberately and entirely left out of the campaign?

The word "free" looms largely on the posters and in printed speeches; I think the word "now" a happier choice. The emphasis which is laid on *free* immunization not only cuts out the private practitioner entirely but tends to suggest that were immunization not available free of cost then it would hardly be worth bothering about at all.

Local authorities are urged by the Ministry of Health to do everything possible to promote the success of the campaign. To me it seems passing strange that private practitioners are not called upon by the Ministry to take part. The family doctors' co-operation is a source of pleasure and valuable help to the average public health medical officer.—I am, etc.,

DEPUTY MEDICAL OFFICER OF HEALTH.

Persistent Blood-giving

SIR,—While it is generally recognized that the amount of blood normally lost by a donor at a sitting is such that its loss does not cause any ill effects, a point of interest appears to be raised by cases, such as occur frequently, where the same donor regularly gives blood for prolonged periods. Is it possible that although, so long as blood-giving at regulated intervals continues, no ill effects are observed the blood-forming mechanism of the body has been unduly stimulated? This might have the effect that while transfusions continued all would be well, but a cessation of blood-giving might give rise to symptoms which could only be relieved by periodical blood-letting. It would be of interest to know whether those in close contact with regular blood donors have noticed any facts lending support to such a view.—I am, etc.,

Chester. E. M. BISKE.

Obituary

SIR JOHN MACPHERSON, C.B., M.D., F.R.C.P.Ed.

Sir John Macpherson died on August 14 at Bristol in his eighty-fifth year. A son of the manse, he was born at Dores, Inverness-shire. He graduated M.B., C.M. at Edinburgh University in 1882, and immediately thereafter was appointed an assistant physician on the staff of Sir Thomas Clouston at the Royal Edinburgh Asylum. His promotion was rapid, because only seven years after graduation he was appointed to the important post of medical superintendent, Stirling District Asylum, Larbert. At Larbert he showed that he was possessed of that rare combination, deep and sympathetic clinical insight and administrative capacity. He modernized the Larbert institution, equipped a pathological department, encouraged research, and at the same time found opportunity to become lecturer in mental diseases at the Royal Colleges School of Medicine, Edinburgh, working in collaboration with the late Sir John Batty Tuke. His textbook, *Mental Affections*, published in 1899, can still be read with much profit; it contains a wealth of clinical material and experience, formulated in a clear, concise, but by no means dry manner. In association with the distinguished Edinburgh surgeon, Sir David Wallace, his brother-in-law, he became interested in the treatment of general paralysis by means of drainage of the cerebrospinal fluid. In 1899 he was appointed Commissioner in Lunacy for Scotland, and held that post with distinction until 1921. His official visits were a delight to the medical superintendents and the assistant physicians in the mental hospitals. He had always interesting and instructive suggestions to make, and gave many of us that extra word of encouragement which meant so much to us. His courtesy and kindliness were a byword amongst us all. In addition to his official duties he was of great assistance to the Scottish Office in 1913 in framing the Mental Deficiency and Lunacy (Scotland) Amendment Act; he served as president of the Special Medical Board (Military) for Scotland in 1917-18; he was a member of the Highlands and Islands Medical Board. As recognition for the great work he had accomplished the Companionship of the Bath was conferred on him in 1917, and in 1922, after he had retired from his post as Commissioner, he was knighted.

Any man might have thought that this was a fitting time to enjoy a well-earned leisure, but Sir John, still interested as he was in psychiatric work, and despite his 65 years, proceeded to Australia, delivered a highly successful series of lectures at the University of Sydney, with the result that a chair of psychiatry was founded, of which Sir John became the first professor. On his retirement, five years later, he returned to this country. A magnificent and very gallant end to a grand career.

Among other special distinctions it should be mentioned that Edinburgh University awarded him a gold medal for his M.D. thesis; in 1904-5 he delivered the Morison Lectures of the Royal College of Physicians; in 1928 he delivered the Maudsley Lecture, taking as his subject "The Present Position of Psychiatry." Finally it remains to mention that in 1910 the Royal Medico-Psychological Association of Great Britain and Ireland conferred on him its highest honour, the presidency.

Now has ended the distinguished career of one of Britain's foremost psychiatrists—a man who up to the very last interested himself in his specialty, and always had a kindly greeting and a helping hand for those of us who were so much junior to him, and owed him so much. Clear-headed, wise, courteous, he had wide cultural and scientific interests which he applied constructively in building up a better psychiatry.

As stated previously, he married a sister of Sir David Wallace, the well-known and distinguished Edinburgh surgeon, and is survived by her and their two daughters, the elder of whom is a B.Sc. of Edinburgh University, while the younger is at present serving with the military Forces as a nurse in the V.A.D.

D. K. H.

JOHN M. T. FINNEY, M.D.

Dr. John M. T. Finney, who died at his home in Baltimore on May 30 at the age of 78, was well known to surgeons in this country as one of the most distinguished members of the staff of the Johns Hopkins Hospital. He belonged to that rapidly diminishing band who were closely associated with Prof. Halsted as assistants in the early pioneering days at Johns Hopkins, for he joined the medical faculty there as long ago as 1893 and ultimately became professor of surgery. John Finney occupied all the important positions in surgery in the United States, including the presidency of the American College of Surgeons, the American Surgical Association, and the exclusive Society of Clinical Surgery, as well as many other bodies. In 1936 he was awarded the Henry Jacob Bigelow Medal for his distinction in and contributions to surgery. During the last war Finney accompanied the American Expeditionary Force to France and acted as chief surgical consultant with the rank of Brigadier-General. For these services he received the D.S.M., but what he much more valued was the gratitude of those large numbers of medical officers who came under his purview and received willing guidance at his hands. In this country he was well known and respected and received many distinctions. Since 1920 he had been an Honorary Fellow of the Royal College of Surgeons of England. He was also an Honorary Fellow of the Medical Society of London and of the Irish College of Surgeons. Finney was in the truest sense a general surgeon, with perhaps a particular interest in the abdomen. As long ago as 1902 he introduced the method of pyloroplasty which has always been associated with his name, but there were many other contributions to practice which have not become eponymous. He made several visits to this country and took part in meetings of the British Medical Association and the Hunterian Society. At home he was generally recognized as a sound surgeon and good teacher, but most of all as a great doctor and an influence for all that was good in the profession. Among his pupils and associates he will always be remembered for the way he put the interests of his patients before all else. Finney had a keen sense of humour, which sometimes took a whimsical turn. He was a great gentleman, and though his loss will be severely felt, there is no doubt that his example and memory will for long continue as an influence in the healing art as practised in America.

G. GREY TURNER.

L. F. WILSON, M.B.

The East Yorkshire Branch of the B.M.A. has lost one of its staunchest supporters in the death on August 7 of Dr. LESLIE FREDERICK WILSON at the comparatively early age of 54. Dr. Wilson served during the last war with the R.A.M.C. and then, in 1924, qualified M.B., Ch.B. at the University of Birmingham. For several years he practised in the Dudley area, and his medico-political activities during that time included being hon. secretary of the Dudley Division (1926-30) and representative at the Annual Meeting at Manchester in 1929. In 1930 he went to East Hull, where he soon established a large practice. There he associated himself with the work of the St. John Ambulance Brigade, being appointed Divisional Surgeon to the Alexandra Dock (L.N.E.R.) Division; in 1938 he was promoted to Corps Surgeon, Hull Corps, St. John Ambulance Brigade, and in the following year to County Surgeon for East Yorkshire. He lectured a good deal on first aid and conducted many examinations for the Brigade's certificate. As a judge in local first-aid competitions he showed a keenness and understanding which resulted in his being asked to judge the Brigade finals in London on one occasion. Dr. Wilson trained a competent staff which has served at the East Hull First-Aid Post under dangerous and difficult conditions. On one occasion ambulances could not reach the post to take the injured to hospital, so Dr. Wilson and his staff improvised a temporary hospital at the post. They worked with the aid of hurricane lamps and candles, and heated the premises with stoves. The post was damaged during other "incidents," but it always carried on under Wilson's untiring and inspiring leadership. For his services he received the M.B.E. (Civil Division) last November. He had many medical interests, and at the time of his death was a member of the East Yorkshire Branch Council, the Local Medical War Committee, the Hull Local Medical and Panel Committee, the Study Group of the Branch and convener of the subgroup for East Hull, and vice-chairman of the Hull Public Medical Service. He was also an active member of the Hull Medical Society.

Dr. Wilson's opinion was highly valued, always concisely expressed, and punctuated with good humour. He had a great sense of duty, and on many occasions visited his patients when he should have stayed at home. Although obviously seriously ill on July 26 he felt it his duty to attend a meeting of the Local Medical War Committee. He was always ready to help his colleagues however busy he might be, and never lost his

pleasant and cheerful bearing. The affection and high esteem with which he was regarded were demonstrated at his funeral, which was attended by representatives of all the various organizations with which he was connected.

C. J. P. writes: Leslie F. Wilson was one of 4 medical students who were closely associated throughout 5 happy, if arduous, years. He set out on a medical career under a heavy handicap which would have deterred all but a resolute soul such as his. Several years older than the majority of students and fresh to study after 4 years on active military service were not the only difficulties he faced and overcame. L. F. had no pretensions, and if he won no prizes his knowledge was sound and of practical value. Despite his handicap he took each examination fence as it came and graduated in due course without a single fault. He was a staunch friend and ever a cheering companion. A rough diamond, may be, but he had the diamond quality. He was the right man to have at hand in a tight corner, for he was never afraid of heavy odds. It is no wonder, therefore, that his work in Civil Defence gained him the M.B.E. He would be at his best, and be one of the best, in charge of a busy first-aid post. His patients were fortunate in their doctor. There will be many who know of his untiring zeal and complete unselfishness, without thought of gain, on their behalf. His 3 fellow students will remember his energetic example and stimulating companionship with gratitude.

We regret to announce the death on August 4 of Dr. STEVEN LONGMORE BUTTERWORTH WILKS, a familiar figure in the life of Colwyn Bay, where he had practised for 33 years. Dr. Wilks received his medical education at the University of Leeds, qualifying M.R.C.S., L.R.C.P. in 1892. In the same year he took the M.B., B.S. of London, proceeding to the M.D. in 1900. He also took the M.B., Ch.B. of Leeds in 1905. Wilks first began practice at Grassington, Wharfedale, where he often used to visit his patients on horseback. From there he went to Colwyn Bay, where, in addition to a busy practice, he was attached, in one capacity or another, for all his professional life to the Colwyn Bay and West Denbighshire Hospital. For over 30 years he was physician and anaesthetist, for some years senior physician, and later honorary consulting physician and honorary consulting anaesthetist to the institution. His hospital work was, perhaps, dearer to him than any other part of his professional life. He took an active interest in all that went on there, and for years the Board of Management benefited by his far-sighted views and sound advice. Dr. Wilks was most sought after as an anaesthetist; he had given thousands of anaesthetics at the hospital, and his surgical colleagues had come to place reliance on his judgment. For many years he was an active member of the B.M.A. and in 1935–6 was chairman of the North Caernarvon and Anglesey Division. A colleague writes: "Dr. Wilks had a sunny, cheerful nature and it was a privilege to be his friend. He was of a modest and retiring disposition, and men are rare who are moved so little by a mercenary motive. He was not ambitious in the ordinary sense of the term, but his ambition was to do good work all day in the service of his fellow men, and as a result he was an exceptionally happy man."

The Services

The Military Cross has been awarded to Capts. R. E. S. Lewis and C. D. Weir, R.A.M.C., and to Capt. A. G. J. P. Fernandes, Capt. R. D. Scriven, and Lieut. D. J. Burnett, I.M.S., in recognition of gallant and distinguished services in the Middle East.

The R.N.V.R. Officers' Decoration has been awarded to Surg. Cmdrs. W. H. Butcher, J. B. Oldham, and H. M. Petty, R.N.V.R.

CASUALTIES IN THE MEDICAL SERVICES

An Admiralty Casualty List published on July 28 gave a list of the ship's complement lost in H.M.S. *Hermes*, aircraft carrier, sunk by enemy action in the Bay of Bengal in April. Among them was Surg. Cmdr. JAMES MICHAEL MCNAMARA, R.N. He was educated at the National University of Ireland, in Dublin, where he graduated M.B., B.Ch., B.A.O. in 1923. After a period in practice he entered the Royal Navy as surg. lieut. in 1929, became surg. lieut.-cmdr. in 1934, and surg. cmdr. in 1940.

Lieut.-Col. HOMI RUSTOMJI CURSETJI, I.M.S., is included as "Died" in an India Office Casualty List published on August 14. He was born on August 13, 1890, and graduated M.B., B.S. of the University of Bombay in 1916 and also took the D.O.M.S. of the English Royal Colleges in 1937. He entered the I.M.S. as temp. lieut. in 1917 and in 1922 received a permanent commission, being ranked as capt. from 1920. He was promoted capt. in 1923, major in 1928, and lieut.-col. in 1936. He served in the war of 1914-18.

Prisoners of War.—Capt. E. F. M. Caraher, R.A.M.C., Capt. A. F. Murray, R.A.M.C., Major J. M. Officer, R.A.M.C., Lieut. A. C. Price, R.A.M.C., Major L. F. Richmond, R.A.M.C., War Subs. Capt. R. L. Sanderson, R.A.M.C., War Subs. Capt. D. B. Watson, R.A.M.C.

Wounded.—Acting Col. D. V. O'Malley, O.B.E., I.M.S.

DEATHS IN THE SERVICES

Colonel WILLIAM RIACH, C.M.G., late R.A.M.C., died at Chula Vista, California, on May 29, aged 70. He was born in Edinburgh on May 24, 1872, and graduated as M.B., C.M. in 1894 at Edinburgh University; he proceeded M.D. with commendation in 1899, also taking the D.P.H. of the Scottish Colleges in 1898. After filling the posts of resident physician at the Edinburgh Royal Infirmary and clinical assistant at the Royal Westminster Ophthalmic Hospital, he went to South Africa as a civil surgeon to serve in the war of 1899-1902. After about eight months' service in that capacity he took a permanent commission as lieutenant in the R.A.M.C. on Nov. 29, 1899, reaching the rank of lieut.-colonel in Feb., 1918. In the South African War he took part in operations in the Orange River Colony and in Cape Colony, receiving the Queen's medal with two clasps. He also served throughout the war of 1914-18. being mentioned in dispatches in Jan., 1916, and receiving the C.M.G. and a brevet colonelcy.

Medical News

The annual general meeting of the British Orthopaedic Association will be held at Nottingham on Sept. 25 and 26 under the presidency of Mr. G. R. Girdlestone. On the morning of Sept. 25 a clinical meeting will be held at the Harlow Wood Orthopaedic Hospital; in the afternoon a discussion on rehabilitation, followed by a demonstration, will be held at the Rehabilitation Centre for Miners, Berry Hill, near Mansfield. On Sept. 26 the meeting will be continued at the General Hospital, Nottingham.

The Home Office announces that Major John Gilmour, C.M.G., *M.C.*, Department of Health for Scotland, has been appointed to fill the vacancy for a temporary Inspector under the Cruelty to Animals Act, 1876.

The committee of award of the Norman Gamble Fund and Research Prize will consider applications for the prize and for grants in aid of research work in Oct. Applications for the prize and for grants in aid must be received by the Secretary of the Royal Society of Medicine, 1, Wimpole Street, London, W.1, not later than Sept. 30.

Dr. P. Gorer of Guy's Hospital will give a lecture entitled "Experimental and Genetical Study of Leukaemia and its Relations to Cancer Research" to the Association of Austrian Doctors in Great Britain on Sunday, Sept. 6, at 11.30 a.m., at 69, Eton Avenue, N.W.3.

Since the beginning of the war over 300 field medical units have been raised in India and are being used in the United Kingdom, the Middle East, and other areas where there are British and Indian troops, while ambulance trains, fully equipped and manned by personnel from India, have been provided for the Eastern theatres of war. These field units did not exist in peacetime, but had to be raised and staffed on the outbreak of war. Although there has been a rapid increase in the number of medical personnel there are not enough to meet future commitments, and many new training schools have, therefore, been started and the existing ones expanded. Consultants from the United Kingdom are helping India in this work. A new, centrally controlled Army medical store organization has been created in India, which is not, however, confining its services to the Army, but is also supplying the Royal Indian Navy and the Royal Air Force. It has, on occasion, provided medical assistance for the American, Chinese, and Russian Armies.

A hospital for the wives of officers and men in the Forces has been opened at Adlington Hall, Cheshire. There is a resident medical officer with special experience in obstetrics, and the consultant obstetricians of Saint Mary's Hospitals, Manchester, pay regular visits and attend whenever required. The fee of £5 5s. a week, which, in a few special instances, may be reduced, is inclusive of medical attention (including visits by the honorary staff), drugs, dressings, etc.

Proposals for the inauguration of a Regional Hospitals Council for Northern Ireland were discussed at a conference in Belfast recently, which was attended by representatives of the Nuffield Provincial Hospitals Trust and of local municipal and voluntary hospitals. The first steps towards this were taken a year ago, when a delegation of the Trust was received by the Governor of Northern Ireland at a conference called to consider a hospital co-ordination scheme for the Province.

Mothers of premature infants can obtain, on presentation of a doctor's certificate, a permit authorizing them to spend additional "points" on condensed milk when supplies are available. The certificate, which should be on a form to be obtained from local food offices, should state that the infant is a premature one, is under the age of 6 months, and needs condensed milk, the weekly quantity needed being also stated. All infants under 1 year are to have a priority supply of liquid milk up to 2 pints daily. It may be taken either in the form of liquid milk or as half liquid and half national dried milk.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week the notifications of measles fell by 857, of whooping-cough by 163, of scarlet fever by 116, and of diphtheria by 70.

The infectious diseases of childhood are prevalent in only a few counties. Scarlet fever and diphtheria are relatively more common in the Northern section of the country than in the Southern. Measles and whooping-cough do not show this geographical difference. This can be illustrated by expressing the notifications in the chief centres of the two sections of the country as a percentage of the total. The percentage distribution for the week under review was:

	Whooping-cough	Measles	Scarlet Fever	Diphtheria
Lancashire and Yorks West Riding	25	32	28	29
London, Middlesex, and Essex	19	26	14	8
England and Wales	100	100	100	100

The notifications of dysentery were 18 higher than in the preceding week. Two small outbreaks occurred in Berkshire, Wallingford R.D. 6 cases, and Hertfordshire, Hemel Hempstead M.B. 9 cases.

In *Scotland* 85 cases of dysentery were notified, compared with 52 in the preceding week. The chief of the local outbreaks were those of Fife County 37 cases. Aberdeen City 22, and Edinburgh 8.

Infectious Diseases in Port Areas

The experience of Glasgow has led to additional precautions being taken by Bristol Port Health Department. Every ship and the crews entering port are to be examined to reduce the risk of importing infection.

Typhoid and Paratyphoid Fevers

A report has appeared in the daily press attributing to Mr. Ernest Brown, Minister of Health, the statement that not one case of typhoid or paratyphoid occurred in this country during 1941. The publication of such a statement is rather surprising in view of the epidemic of last summer in the Liverpool area, which, originating in a multiple baker's business, involved some 800 persons. Altogether there were 4,703 notifications of paratyphoid and typhoid fevers in England and Wales during 1941, with 148 deaths—a fatality rate of 3.1%. The trend of these diseases during the present year has been exceptionally low, the number of notifications during the first 30 weeks of the last six years, 1937-42, being 1,004, 672, 659, 1,340, 3,227, and 502.

Memorandum on Scabies

The Ministry of Health has issued a revised edition of the Memorandum on Scabies which was published in January, 1940: it deals with the condition under the headings of "Life History and Habits," "Symptoms," "Complications," "Differential Diagnosis," "Method of Spread and Prevention," and "Treatment." It can be obtained at H.M. Stationery Office for 1d.

Returns for the Week Ending August 15

The notifications of infectious diseases in England and Wales during the week included the following: scarlet fever 1,332, whooping-cough 1,125, diphtheria 665, measles 4,983, acute pneumonia 440, cerebrospinal fever 70, acute poliomyelitis 15, dysentery 51, paratyphoid 13, typhoid 15.

No. 31

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended August 8.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1942 (a)	(b)	(c)	(d)	(e)	1941 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	77	—	24	7	11	166	12	39	8	9
Deaths		—	1				2	1		
Diphtheria	580	26	164	55	14	727	31	204	25	38
Deaths	11	1	1	1	—	26	2	—	3	1
Dysentery	82	9	85		—	122	7	52		—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	4	—	—	—	—	5	—	2	1	—
Deaths		—	—				—	—		
Enteric (typhoid and paratyphoid) fever						34	—	1	5	3
Deaths						—	—	—	1	—
Erysipelas		—	54	6	—		—	42	6	5
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years				93						
Deaths	34	3	12	13	5	34	4	5	15	2
Measles	5,619	563	126	26	64	3,084	101	42	143	1
Deaths	8	—	5	—	—	4	—	—	1	—
Ophthalmia neonatorum	81	5	17	1	—	86	3	18	2	—
Deaths										
Paratyphoid fever	15	—	3	—	—	194	—	13	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal*	413	19	3	2	2	424	11	13	—	—
Deaths (from influenza)	10	—	3	—	—	4	—	—	1	3
Pneumonia, primary			129	16				124	12	
Deaths		9		3	16		—		8	—
Polio-encephalitis, acute	4	1				5	—			
Deaths		—					—			
Poliomyelitis, acute	10	1	4	4	—	28	—	9	2	—
Deaths		1	—				—	—		
Puerperal fever	—	2	6	4	—	1	1	18	5	—
Deaths		3					—			
Puerperal pyrexia	142	10	11		4	135	9	12		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,340	86	231	46	28	863	38	107	36	18
Deaths	—	—	—	—	—	1	—	—	—	—
Small-pox	—	—	2		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhoid fever	6	—	7	7	1					
Deaths	1	—	—	—	—					
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	953	83	14	50	13	3,731	251	59	63	5
Deaths	2	1	1	3	—	22	2	4	2	—
Deaths (0–1 year)	271	27	48	34	29	229	23	46	51	19
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,475	483	505	149	129	3,596	513	573	190	113
Annual death rate (per 1,000 persons living)			11.4	9.9	†			12.5	12.6	†
Live births	5,626	606	836	400	269	4,518	331	796	354	202
Annual rate per 1,000 persons living			17.3	26.7	†			16.2	23.5	†
Stillbirths	206	14	38			191	24	27		
Rate per 1,000 total births (including stillborn)			43					33		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Secretary of the Journal Board, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be sent to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London;* SECRETARY, *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Treatment of Seborrhoea

F.R.C.S. would be most grateful to any reader who could help him to be relieved of a chronic troublesome skin complaint described as seborrhoea. It occurs in small brown patches on his bald head and temples and spreads at the periphery. The patches can be peeled off sometimes in thin small flakes, leaving a sore place with crusts. It does not yield to ointment of sulphur with benzoic and salicylic acids—the usual treatment advised.

Itching of Limbs

Dr. WILLIAM STOBIE (Oxford) writes: Has Dr. W. A. Milligan (Aug. 15, p. 208) tried cannabis indica, first brought to my notice by the late Dr. Wm. Collier?

Coltsfoot

Dr. C. W. BADGER (Penicuik) writes: I asked an old patient who has used coltsfoot for some time to give me a note on it. I enclose his note. Its use seems to keep him quiet.

"In regard to query about coltsfoot I have collected and smoked this for some considerable time. So far as I am aware there is no hard-and-fast rule as to the time for collecting the leaves, although August is said to be the best time. However, I have collected them in all stages of their development, from their first appearance to the withering stage, and found no practical difference. The leaves are simply collected and dried in the sun, or at the fire, until absolutely dry or nearly so, then rubbed down to shreds and packed in an air-tight tin. Sometimes they are mixed with a little lavender to give the smoke a perfume. Since 1921 I have been subject to occasional attacks of asthma, at times severe, but since starting to smoke coltsfoot and inhale the smoke I have had only one slight attack which I think was brought on by a chill."

Premaxillary Cysts

Mr. H. T. ROPER-HALL (Birmingham) writes: Will members of the profession please let me have details, models, radiographs, specimens, or histories of cysts in the premaxillary region; especially those in the region of the lateral tooth, in which diagnosis was complicated or origin uncertain and the teeth not, apparently, involved. Material will be appreciated and acknowledged; all specimens, etc., will be returned.

Income Tax

Billeting Allowance

"Q" is a pathologist in the E.M.S., receiving a salary of £800 and an extra allowance of £100 as he is "billeted." He is keeping his home going and visits it each week-end. Is he liable to income tax on the £100?

***As it is money paid and received under a service contract and as the expenses with regard to which it is paid are personal in general character the amount in question appears to be legally liable to assessment.

LETTERS, NOTES, ETC.

Loss of Hair after Air Raids

Mr. FRANK BODMAN (Bristol) writes: The case of depression–hyposexual–alopecia syndrome (July 18, p. 67) reminds me of a man, aged 36, whom I saw last year, who lost all his hair following experiences in air raids in Bristol. He was a fireman attached to a railway goods yard, and had a series of alarming incidents to deal with. He lost all his scalp hair and his eyebrows, but retained his beard and axillary and pubic hair. Emotionally he was stable. There was no evidence of depression, and he experienced no loss of sexual feeling or power. He was merely self-conscious about his peculiar appearance. Under a course of ultraviolet-light treatment he recovered his hair and eyebrows, although at first the hair returned in patches, so that during the recovery stage he resembled a case of alopecia areata. There was no greying of the new hair.

Bed-pan for Patients with Fractured Femur

Dr. W. J. GUNNE (Kenora, Ontario) writes with reference to "Naval Patient's" comments on the hospital bed-pan (June 6, p. 710): In the old days when we used Liston's long splint in fractures of the femur (and good results we got, too) we made a mattress as follows. Out of the centre of a mattress on one side we removed a portion of the mattress and slid in the bed-pan. After use it was removed and replaced by the portion of the mattress. We found this worked well.

Declining Population

Dr. B. DUNLOP writes: I welcome the statements of Mr. V. B. Green-Armytage that no one finds fault with spaced births after the first child and that it is impossible to suppress birth control. But I know many medical colleagues who will share my disagreement with the view that freedom for birth control spells race suicide and economic ruin, and I regret that it was expressed in a journal which cannot give space to economics.

Mrs. MARIE C. STOPES, D.Sc., writes: The letter from Mr. V. B. Green-Armytage in your issue of Aug. 1 raises several points which on the face of it appear rather conflicting. It is very important, however, to know what method of control of conception he approves, since he says: "No one finds fault with spaced births after the first child." I sympathize greatly with his condemnation of "quinine and mercury and other noxious ingredients." Compounds of mercury are now, alas! being encouraged by the society of which Lord Horder is the president in spite of my unavailing protests. Perhaps your readers may find it useful to know that headquarters constructive birth control clinics are available for free patients in the following towns and these are all open daily from 10 to 6: Aberdeen, Belfast, Cardiff, Leeds, and London. At these clinics no noxious substances of any sort, but only absolutely bland and safe contraceptives, are supplied.

MEDICINE 100 YEARS AGO

Extract from the *Provincial Medical Journal* for August 27, 1842:

"In our last number we mentioned the changes which had recently taken place in the medical department of the University of Edinburgh. Dr. Home has resigned the chair of practice of medicine, to which Dr. Alison has been unanimously elected, and Dr. Henderson fills the chair of pathology, vacant by the resignation of Dr. Thompson. The election of Dr. Alison to the chair of practice of physic cannot fail to be most beneficial to the university. The truth is, that time had laid his heavy hand on many of the professors, and the state of oral instruction had become intolerable. Dr. Home especially was long since physically incapable of fulfilling the duties of the office which he held. It is now many years since we assisted at a lecture given by the worthy professor. The pupils were *'rari nantes'* in the vast amphitheatre; one half of them were playing cards; the other half listening to the notes of an old violin, on which an Irish student was playing 'Home, sweet home'; while the professor, unconscious of that which was passing on above him, mumbled from an ancient manuscript words unheard by himself, and unheeded by his pupils. The valedictory letter of Professor Home to the University of Edinburgh is worthy of being placed on record; it is thus conceived:

'Edinburgh, August 8, 1842.

My Lord,—Having for forty-four years discharged the duties of the chairs of materia medica and of the practice of medicine; considering also that, from my very advanced age (although still enjoying the most perfect health), I am become unable to perform the important duties of the professorship, which I now hold, also wishing, before I go home, to have some time free from my laborious duties, I have for some time intended, and now herewith offer to your lordship and the other honourable patrons of the college, to resign the professorship of the practice of medicine, on condition of your providing a retiring allowance of £300 sterling per annum, and making such other arrangements as may seem necessary for securing the requisite payments of the said allowance during my life.—I am, &c.

JAMES HOME.

To the Right Hon. the Lord Provost.'

The £300 per annum with which the career of the professor thus characteristically terminates is to be taken from the pockets of his successors, £150 being paid by Dr. Alison, the remainder by the professor of theory of medicine. It is questionable how far it may be a prudent measure to leave the burthen of Dr. Home's retiring pension on his successors; but we suppose that it was a matter of necessity, and that the university possesses no funds whence the pension could be derived. But enough of Dr. Home and his pension; the subject on which we are desirous of saying a few words is the election to the chair of pathology."